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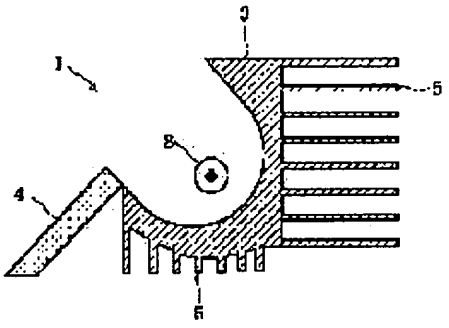
(54) EXPOSURE UNIT AND FIXING UNIT

(57)Abstract:

PROBLEM TO BE SOLVED: To improve cooling efficiency by providing a cooling fin.

SOLUTION: An exposure unit 1 generates heat by turning on a halogen lamp 2 in the case of operation, and a reflector 3 is heated by the generated heat of the lamp 2. A radiating fin 5 is formed on the reflector 3, and air is sent to the reflector 3 and the fin 5 along the disposing direction of the fin 5 from a fan. The heat of the reflector 3 is efficiently radiated through the fin 5 by the air from fan sent to the fin 5, so that the temperature of the reflector 3 is restrained from rising.



CLAIMS

[Claim(s)]
[Claim 1] The exposure unit characterized by being the exposure unit equipped with the predetermined distance detached building ****** reflecting mirror from the exposure lamp concerned, and preparing the fin for heat dissipation in said exposure lamp of said reflecting mirror, and the field of the opposite side in the predetermined range around the exposure lamp which irradiates light at a manuscript, and said exposure lamp.
[Claim 2] Said reflecting mirror is an exposure unit according to claim 1 characterized by attaching the fan who ventilates said fin for heat dissipation in air.
[Claim 3] Said fin for cooling is claim 1 characterized by being arranged in parallel to the flow direction of the air which flows the perimeter of said reflecting mirror, and an exposure unit according to claim 2.
[Claim 4] The fixing unit are the fixing unit equipped with the fixing roller by which is heated at a heater and a rotation drive is carried out, the pressurization roller which a pressure welding is carried out to said fixing roller, and rotates with said fixing roller, and said pressurization roller of said fixing roller and the fan who ventilates [opposite side] the perimeter of wrap fixing covering and said fixing covering in air at least, and carry out that the fin for heat dissipation is prepared in the passage part of the air from said fan of said fixing covering at least as the description.
[Claim 5] The fixing roller by which is heated at a heater and a rotation drive is carried out, and the pressurization roller which a pressure welding is carried out to a fixing fixing roller, and rotates with a fixing fixing roller, At least said pressurization roller and opposite side of said fixing roller Wrap fixing covering, The fixing unit characterized by being the fixing unit equipped with the fan who ventilates the perimeter of said fixing covering in air, preparing the fin for heat dissipation in the field by the side of said fixing roller of said fixing covering, and turning said fan's ventilation direction to the fin for heat dissipation concerned.
[Claim 6] It is the fixing unit according to claim 5 characterized by forming said fixing covering by the adiathermic good member, and forming said fin for heat dissipation by the member with good thermal conductivity.

[Translation done.]

precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the exposure unit and fixing unit which raised cooling effectiveness in the detail about an exposure unit and a fixing unit.
[0002]
[Description of the Prior Art] In a copying machine, a laser beam printer, a scanner, etc., it has exoergic units, such as an exposure unit and a fixing unit, and it is an important problem how heat is radiated and the heat generated from these exoergic units is exhausted.
[0003] For example, a copying machine will be divided into the optical unit which used the lamp which reads a manuscript optically, the imaging unit which performs each process of electrification -> exposure -> development -> imprint -> electric discharge for a photo conductor, a development unit, the fixing unit which carries out welding of the toner in the copy paper to paper, and a pan by five units of a power supply unit if the unit configuration is divided roughly.
[0004] Only a fixing unit needs heat among these five units, heat occurs as a side effect and it is important for other units how heat is radiated and these generated heat is exhausted so that neither electronic parts nor process control may be affected.
[0005] In an optical unit, the reflecting plate arranged in the perimeter of a halogen lamp since the halogen lamp was generally used is heated by the exposure unit with a halogen lamp, the life of a halogen lamp is affected, or the metal side of a reflecting plate oxidizes, and the problem of the quantity of light irradiated by the manuscript decreasing arises.
[0006] Although the fan was attached and the whole exposure unit was cooled in order to cool an exposure unit conventionally, the hot spot where temperature is high cannot be cooled efficiently.
[0007] Moreover, the heat which the fixing unit needs has a thermal effect on surrounding passive circuit elements etc., or a fixing unit raises the temperature in [whole] a copying machine, and fault, such as having a bad influence on process control, produces it. Then, generally, although the heat exhaust air by the fan was performed or measures, such as heat insulation, were taken, effectiveness was not able to say conventionally that it was good too.
[0008] In addition, the conventional air-cooling method of general electronic equipment as indicated by JP,63-108800,A As passage is secured for the flow of the air of air supply and exhaust within a case, it cools or nature and forced-air cooling are indicated by JP,2-82693,A by making a case into a first-class way Having the inhalation means and ventilating fan for circulating air within and without a case, and forming a septum so that the flow of air may be made to separate, and cooling an equipment is performed.
[0009] Moreover, the technique of raising the cooling engine performance is indicated by JP,6-318124,A by centralizing a high heater element on one place, and connecting with the heat sink which turned and prepared them in the case exterior.
[0010]
[Problem(s) to be Solved by the Invention] However, in addition in such a conventional cooling technique, it is not enough as a cooling technique of the device equipped with the exposure unit or the fixing unit.
[0011] Namely, although above-mentioned JP,63-108800,A and the conventional technique

given in JP,2-82693,A can expect sufficient cooling effect when securing the airstream way which connects the inside and outside of a case in a case and cooling the whole case If it was in the device equipped with the exposure unit or the fixing unit, still more efficient cooling needed to be performed, the cooling effect to mean was not acquired and each above-mentioned conventional technique had problems -- sufficient cooling effect is not acquired by the rise of the exoergic consistency accompanying the miniaturization of a device.
[0012] Moreover, the conventional technique given [above-mentioned] in JP,6-318124,A is suitable when cooling the junction component of a substrate board with a heat sink, but when it has the exoergic unit as the configuration unit, in order that the part to cool may attain to the whole unit like a copying machine, it does not serve as sufficient solution means.
[0013] It is important for a copying machine, a laser beam printer, a scanner, etc. that there is a unit for which the configuration unit uses heat like a fixing unit especially unlike a computer and other electronic equipment, and a unit with large calorific value also cools a thermal design intricately and efficiently like an exposure unit for a certain reason.
[0014] Furthermore, recently, the miniaturization of a device progresses, a downsizing design is performed also for each unit of a device, and by this miniaturization, while the exoergic consistency of each unit rises, reservation of the space which a case dimension spares for installation of a cooling fan by becoming small, and cooling passage is becoming difficult.
[0015] Then, by establishing the perimeter of an exposure lamp for the fin for heat dissipation in the exposure lamp of a wrap reflecting mirror, and the field of the opposite side, invention according to claim 1 radiates heat efficiently through the fin for heat dissipation in the heat of a reflecting mirror, suppresses the temperature rise of a reflecting plate low, and aims at offering the exposure unit which cools efficiently the exposure lamp which is the light source of an exposure unit, and the reflecting mirror surrounding it.
[0016] Invention according to claim 2 ventilates the fin for heat dissipation directly and effectively from a fan by ****** with picking in the fan who ventilates in air the fin for heat dissipation prepared in the reflecting plate, cools the fin for heat dissipation, and aims at offering the exposure unit which can raise cooling effectiveness further.
[0017] By arranging the fin for cooling in parallel to the flow direction of the air which flows the perimeter of a reflecting mirror, invention according to claim 3 aims at offering the exposure unit which can raise cooling effectiveness further, as air flows along the array side of the fin for heat dissipation.
[0018] Invention according to claim 4 by carrying out the pressure welding of a fixing roller and the pressurization roller, and preparing the fin for heat dissipation in the passage part of the air from the fan of the fixing covering of the fixing unit with which the fixing roller was covered with fixing covering concerned Heat is radiated with the air from a fan which flows the fin for heat dissipation in the heat of fixing covering, the temperature of a fixing covering front face is reduced efficiently, and it aims at offering the fixing unit which can prevent the thermal effect to a perimeter.
[0019] While invention according to claim 5 prepares the fin for heat dissipation in the field by the side of the fixing roller of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned With the fin for heat dissipation prepared in the field by the side of a fixing roller not only heat insulation but for heat dissipation by ventilating this fin for heat dissipation from a fan using fixing covering It aims at offering the fixing unit which can decrease the heating value which cools with the air from a fan and is transmitted [heat / endoergic and / which carried out the collection of heat and was brought together in the fin for heat dissipation] outside from fixing covering in the excessive heat from a fixing roller.
[0020] By invention according to claim 6 forming fixing covering by the adiathermic good member, and forming the fin for heat dissipation by the member with good thermal conductivity

the good fin for heat dissipation of the thermal conductivity of a copper alloy, an aluminium alloy, etc. -- surrounding heat -- more -- much more -- a response -- good -- endoergic -- or, while carrying out a collection of heat It aims at offering the fixing unit which can control further that the heat from a fixing roller is transmitted outside with adiathermic fixing coverings, such as heat-resistant plastics.

[0021]

[Means for Solving the Problem] The exposure unit of invention according to claim 1 has attained the above-mentioned purpose by being the exposure unit equipped with the predetermined distance detached building ****** reflecting mirror from the exposure lamp concerned, and preparing the fin for heat dissipation in said exposure lamp of said reflecting mirror, and the field of the opposite side in the predetermined range around the exposure lamp which irradiates light at a manuscript, and said exposure lamp.

[0022] According to the above-mentioned configuration, since the perimeter of an exposure lamp is established for the fin for heat dissipation in the exposure lamp of a wrap reflecting mirror, and the field of the opposite side, heat can be efficiently radiated through the fin for heat dissipation in the heat of a reflecting mirror, the temperature rise of a reflecting plate can be suppressed low, and the exposure lamp which is the light source of an exposure unit, and the reflecting mirror surrounding it can be cooled efficiently.

[0023] The fan by whom said reflecting mirror ventilates said fin for heat dissipation in air may be attached so that it may indicate to claim 2 in this case.

[0024] Since the fan who ventilates in air the fin for heat dissipation prepared in the reflecting plate is attached according to the above-mentioned configuration, the fin for heat dissipation can be ventilated directly and effectively from a fan, the fin for heat dissipation and a reflecting plate can be cooled, and cooling effectiveness can be raised further.

[0025] Moreover, for example, said fin for cooling may be arranged in parallel to the flow direction of the air which flows the perimeter of said reflecting mirror so that it may indicate to claim 3.

[0026] Since the fin for cooling is arranged in parallel to the flow direction of the air which flows the perimeter of a reflecting mirror according to the above-mentioned configuration, air can flow along the array side of the fin for heat dissipation, and cooling effectiveness can be raised further.

[0027] The fixing roller by which the fixing unit of invention according to claim 4 is heated at a heater, and a rotation drive is carried out, The pressurization roller which a pressure welding is carried out to said fixing roller, and rotates with said fixing roller, At least said pressurization roller and opposite side of said fixing roller Wrap fixing covering, It is the fixing unit equipped with the fan who ventilates the perimeter of said fixing covering in air, and the above-mentioned purpose is attained by preparing the fin for heat dissipation in the passage part of the air from said fan of said fixing covering at least.

[0028] Since the fin for heat dissipation has been prepared in the passage part of the air from the fan of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the above-mentioned configuration, heat can be radiated by the air from a fan which flows the fin for heat dissipation in the heat of fixing covering, the temperature of the front face of fixing covering can be reduced efficiently, and the thermal effect to a perimeter can be prevented.

[0029] The fixing roller by which the fixing unit of invention according to claim 5 is heated at a heater, and a rotation drive is carried out, The pressurization roller which a pressure welding is carried out to a fixing fixing roller, and rotates with a fixing fixing roller, At least said pressurization roller and opposite side of said fixing roller Wrap fixing covering, It is the fixing unit equipped with the fan who ventilates the perimeter of said fixing covering in air, and the fin

for heat dissipation was prepared in the field by the side of said fixing roller of said fixing covering, and the above-mentioned purpose is attained by turning said fan's ventilation direction to the fin for heat dissipation concerned.
[0030] While preparing the fin for heat dissipation in the field by the side of the fixing roller of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the above-mentioned configuration Since this fin for heat dissipation is ventilated from a fan, with the fin for heat dissipation prepared in the field by the side of a fixing roller not only heat insulation but for heat dissipation using fixing covering The heating value which can cool with the air from a fan and is transmitted [heat / endoergic and / which carried out the collection of heat and was brought together in the fin for heat dissipation] outside from fixing covering in the excessive heat from a fixing roller can be decreased.
[0031] Said fixing covering may be formed by the adiathermic good member, and said fin for heat dissipation may be formed by the member with good thermal conductivity so that it may indicate to claim 6 in this case.
[0032] Since according to the above-mentioned configuration fixing covering is formed by the adiathermic good member and the fin for heat dissipation is formed by the member with good thermal conductivity, while being able to carry out a collection of heat, it can control further endoergic or that the heat from a fixing roller is transmitted outside with adiathermic fixing coverings, such as heat-resistant plastics, for surrounding heat with a much more sufficient response with the good fin for heat dissipation of the thermal conductivity of a copper alloy, an aluminium alloy, etc.
[0033]
[Embodiment of the Invention] Hereafter, the gestalt of suitable operation of this invention is explained to a detail based on an accompanying drawing. In addition, since the gestalt of the operation described below is a gestalt of suitable operation of this invention, desirable various limitation is attached technically, but especially the range of this invention is not restricted to these modes, as long as there is no publication of the purport which limits this invention in the following explanation.
[0034] Drawing 1 is drawing showing the gestalt of operation of the 1st of the exposure unit of this invention, and the gestalt of this operation corresponds to claim 1 and claim 3. Drawing 1 is the side-face sectional view of the exposure unit 1 which applied the gestalt of operation of the 1st of the exposure unit of this invention.
[0035] In drawing 1 , the exposure unit 1 is equipped with the halogen lamp 2 and reflecting plate 3 as the light source, and air is ventilated by the field of drawing 1 in the direction of a vertical from the fan who does not illustrate to the exposure unit 1.
[0036] According to manuscript reading width of face, the halogen lamp 2 has predetermined die length, and irradiates light at the manuscript which is not illustrated. The light reflected with this manuscript is introduced into optoelectric transducers (for example, CCD (Charge Coupled Device) etc.) through the optical system of the 1st mirror 4 and others, and is changed into image data by the optoelectric transducer.
[0037] Predetermined spacing detached building ****** of the reflecting plate 3 is carried out with the halogen lamp 2, the field by the side of a halogen lamp 2 is formed in an about U character mold, and it is polished in the mirror plane. The fin 5 for heat dissipation projected to the method of outside is formed in the halogen lamp 2 of a reflecting plate 3, and the external surface of the opposite side from the external surface concerned of a reflecting plate 3, and the fin 5 for heat dissipation is formed all over the external surface of a reflecting plate 3. Each fin 5 for heat dissipation is formed in the direction perpendicular to the field of drawing 1 for a long time, and is arranged in parallel in the ventilation direction from the above-mentioned fan. The reflecting plate 3 and the fin 5 for heat dissipation are formed by a member with both good

thermal conductivity, for example, an aluminum containing alloy.
[0038] Next, actuation of the gestalt of this operation is explained. If a halogen lamp 2 is turned on at the time of actuation, a halogen lamp 2 will generate heat and, as for the exposure unit 1, a reflecting plate 3 will be heated by generation of heat of a halogen lamp 2. However, the fin 5 for heat dissipation is formed in the reflecting plate 3, and air is ventilated from a direction perpendicular to the space of drawing 1 from the fan who does not illustrate at a reflecting plate 3 and the fin 5 for heat dissipation. Therefore, the heat of a reflecting plate 3 can radiate heat efficiently through the fin 5 for heat dissipation with a fan's air ventilated by the fin 5 for heat dissipation, and can control the temperature rise of a reflecting plate 3.
[0039] Moreover, since the fin 5 for heat dissipation is arranged in parallel with the flow of the air from a fan and is formed, the air from a fan can flow between the fins 5 for heat dissipation along with the fin 5 for heat dissipation, and it can radiate heat much more efficiently from the fin 5 for heat dissipation.
[0040] <Example of an experiment> The exposure unit 1 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the conventional exposure unit of only the reflecting plate with which the fin for heat dissipation is not formed were conducted.
[0041] In order for an experiment to stick a thermocouple, respectively the inside of the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation, and inside the reflecting plate of the conventional exposure unit and not to saturate a temperature rise, the line performed the temperature comparison of the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation with which the thermocouple at that time detected continuation copy actuation by 100 sheets, and the reflecting plate of the conventional exposure unit. In addition, both the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation and the reflecting plate of the conventional exposure unit are formed of aluminum in this case.
[0042] In the conventional exposure unit to which, as for the experimental result, a fin is not attached, the rise temperature (increment from a room temperature) of a reflecting plate was as high as 50 degrees C, and fault had produced the reflecting plate made from aluminum also for mechanical precision -- when it becomes cloudy locally by scaling or an exposure unit scans, a squeak carries out.
[0043] On the other hand, if it was in the exposure unit 1 of the gestalt of this operation, rise temperature was as low as 35 degrees C, and faults by oxidation of the front face of the reflecting plate 3 which had been produced conventionally, such as local nebula and a squeak, were canceled. Therefore, it was checked by forming the fin 5 for heat dissipation in the front face of a reflecting plate 3 that the cooling effect is improving.
[0044] Drawing 2 is drawing showing the gestalt of operation of the 2nd of the exposure unit of this invention, and the gestalt of this operation corresponds to claim 2 and claim 3.
[0045] In addition, the gestalt of this operation is applied to the same exposure unit as the gestalt of implementation of the above 1st, gives the same sign to the same component as the exposure unit of the gestalt of implementation of the above 1st in explanation of the gestalt of this operation, and omits the detailed explanation.
[0046] In drawing 2 , the exposure unit 10 is equipped with the halogen lamp 2, the reflecting plate 3, and fan 11 who do not illustrate, and the fin 5 for heat dissipation is formed in the reflecting plate 3.
[0047] The fan 11 is attached in the one side side face (left-hand side side face of drawing 21) of a reflecting plate 3, and ventilates air toward a reflecting plate 3 and a halogen lamp 2. That is, the fan 11 is attached in the reflecting plate 3 with which the fin 5 was formed as one. The fin 5 for heat dissipation currently formed in the reflecting plate 3 is formed in parallel along the flow direction of the air from a fan 11, and the air ventilated by the fan 11 flows along with a fin 5. That to which the thing of 40mmx40mm and t= 10mm thickness is used, and this fan 11

operates with the direct current voltage (DC) of 12 [V] and the current of 80 [mA] is used. The rotation drive of the fan 11 is carried out synchronizing with lighting actuation of a halogen lamp 2.

[0048] Therefore, since according to the gestalt of this operation the fan 11 is attached while forming the fin 5 for heat dissipation in a reflecting plate 3, while carrying out air cooling of a halogen lamp and the reflecting plate 3 with the air from a fan 11, the heat of a reflecting plate 3 can be made to be able to radiate heat much more efficiently through the fin 5 for heat dissipation, and the temperature rise of a reflecting plate 3 can be controlled further. Since the fin 5 for heat dissipation is especially arranged along a fan's 11 ventilation direction, the air from a fan 11 can flow between the fins 5 for heat dissipation along with the fin 5 for heat dissipation, and can radiate heat much more efficiently from the fin 5 for heat dissipation in the heat of a reflecting plate 3.

[0049] <Example of an experiment> The exposure unit 10 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the conventional exposure unit of only the reflecting plate with which the fin for heat dissipation is not formed were conducted.

[0050] In order for an experiment to stick a thermocouple on the reflecting plate of the inside of the reflecting plate 3 of the exposure unit 10 of the gestalt of this operation, and the conventional exposure unit, respectively and not to saturate a temperature rise, the line performed the temperature comparison of the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation with which the thermocouple at that time detected continuation copy actuation by 100 sheets, and the reflecting plate of the conventional exposure unit. In addition, both the reflecting plate 3 of the exposure unit 10 of the gestalt of this operation and the reflecting plate of the conventional exposure unit are formed of aluminum in this case.

[0051] In the conventional exposure unit to which, as for the experimental result, a fin is not attached, the rise temperature (increment from a room temperature) of a reflecting plate was as high as 50 degrees C like the above-mentioned example of an experiment, and fault had produced the reflecting plate made from aluminum also for mechanical precision -- when it becomes cloudy locally by scaling or an exposure unit scans, a squeak carries out.

[0052] On the other hand, if it was in the exposure unit 10 of the gestalt of this operation, rise temperature was still lower than the exposure unit 1 of the gestalt of implementation of 25 degrees C and the above 1st, and while faults by oxidization of the front face of the reflecting plate 3 which had been produced conventionally, such as local nebula and a squeak, were canceled, Bure of images, such as a jitter, was canceled. Therefore, while forming the fin 5 for heat dissipation in the reflecting plate 3, it was checked by ventilating the reflecting plate 3 with which the fin 5 for heat dissipation was formed from the fan 11 that the cooling effect is improving further.

[0053] In addition, in the gestalt of this operation, although the fan 11 is attached in the left end side of the reflecting plate 3 of drawing 2 , a fan 11 may attach in the right end side of a reflecting plate 3, and may attach a fan 11 in each right and left of a reflecting plate 3 according to the magnitude of a temperature rise, and may use it by the push pull.

[0054] Moreover, in the gestalt of the above 1st and the 2nd implementation, although the fin 5 for heat dissipation is arranged in parallel with the longitudinal direction of a reflecting plate 3, the array direction of the fin 5 for heat dissipation may not be restricted to what is arranged to the longitudinal direction of a reflecting plate 3, and may be formed according to the flow direction of the air ventilated by the reflecting plate 3 from an external fan or the fan 11 attached in the reflecting plate 3. For example, as shown in drawing 3 , when the airstream from an external fan or the fan 11 attached in the reflecting plate 3 flows in the direction of a short hand of a reflecting plate 3 (direction shown by the arrow head of drawing 3), the fin 12 for heat dissipation is formed in the direction of a short hand of the reflecting plate 3 with which

the airstream concerned flows.
[0055] In addition, as shown in drawing 3 , the fin 12 for heat dissipation was formed, and when carried out like the example of an experiment which explained the experiment of the temperature rise of an exposure unit with the gestalt of implementation of the above 1st by the ventilation only from an external fan, the rise temperature of a reflecting plate 3 was suppressed by 30 degrees C.
[0056] Drawing 4 is drawing showing the gestalt of operation of the 3rd of the fixing unit of this invention, and the gestalt of this operation corresponds to claim 4. Drawing 4 is the side-face sectional view of the fixing unit 20 which applied the gestalt of operation of the 3rd of the fixing unit of this invention.
[0057] In drawing 4 , the heaters 23 and 24 at which the pressure welding of the fixing roller 21 and the pressurization roller 22 with which the rotation drive of the fixing unit 20 is carried out is carried out, and they heat a fixing roller 21 and the pressurization roller 22 on a fixing roller 21 and the pressurization roller 22, respectively are built in.
[0058] The lower part of the pressurization roller 22 is covered with the bottom plate 25, and while the inner plate 26 is arranged, the fixing covering 27 is arranged in the upper part of a fixing roller 21 so that the upper part of an inner plate 26 and the right-and-left both sides of a fixing roller 21 may be covered. Two or more fins 28 for heat dissipation are formed in the left-hand side external surface of the fixing covering 27, and the fin 28 for heat dissipation is formed in it to the space of drawing 4 in the condition of extending for a long time to predetermined die length, for example, 350mm, covering the direction of a vertical. Cooling air is ventilated from the external fan who does not illustrate by the part in which the fin 28 for heat dissipation of the fixing covering 27 is formed.
[0059] The recording paper with which the feed guide 29 adhered to the toner image is conveyed by the pressure-welding section of a fixing roller 21 and the pressurization roller 22, the toner image in the record paper is fixed to the recording paper with the fixing roller 21 and the pressurization roller 22 which are heated at heaters 23 and 24, and the delivery guide 30 top is discharged on the paper output tray outside drawing.
[0060] Next, actuation of the gestalt of this operation is explained. A fixing unit 20 is in the condition that the fixing roller 21 was heated at the heater 23, and the pressurization roller 22 was heated at the heater 24, if the recording paper which adhered the feed guide 29 top to the toner image is conveyed by the pressure-welding section of a fixing roller 21 and the pressurization roller 22, carries out the welding of the toner in the record paper to the recording paper with the heated fixing roller 21 and the pressurization roller 22, and will discharge a delivery guide 30 top for the recording paper which fixing completed.
[0061] At this time, the wrap fixing covering 27 is heated in a fixing roller 21 by the heat which radiates heat from the fixing roller 21 heated at the pressurization roller 24 and heater 23 which are heated at a heater 22.
[0062] However, to the fixing covering 27, it can prevent that can radiate for it heat and exhaust the heat of the fixing covering 27 efficiently from a radiation fin 28 into it, and the fixing covering 27 is overheated since the fin 28 for heat dissipation is formed in the part by which the cooling air from the external fan is ventilated. That is, since heat required in order to carry out welding of the toner exerts a side effect on the unit around a device, efficient exhaust heat can be performed by combining the flow and the fin 28 for heat dissipation of air inside the plane for heat other than the need the optimal.
[0063] <Example of an experiment> The fixing unit 20 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the fixing unit of the same configuration of that the conventional fin for heat dissipation is not formed were conducted.
[0064] The experiment stuck the thermocouple on the top face of the fixing covering 27 of the

fixing unit 20 of the gestalt of this operation, and the top face of fixing covering of the conventional fixing unit, and carried out relative measurement of the temperature rise at the time of making fixing actuation perform.
[0065] There was little effectiveness which it cools in case an experimental result flows the side face of fixing covering in which the flow of the air from an external fan was formed in the flat surface, in the conventional fixing unit in which a fin is not formed, therefore the temperature of fixing covering was rising also at 105 degrees C.
[0066] On the other hand, in the fixing unit 20 of the gestalt of this operation, the temperature rise was to 85 degrees C. Therefore, in order that air might flow between many fins 28 for heat dissipation, it was checked that cooling effectiveness is high.
[0067] Drawing 5 is drawing showing the gestalt of operation of the 4th of the fixing unit of this invention, and the gestalt of this operation corresponds to claim 5 and claim 6.
[0068] In addition, the gestalt of this operation is applied to the same fixing unit as the gestalt of implementation of the above 3rd, gives the same sign to the same component as the fixing unit of the gestalt of implementation of the above 3rd in explanation of the gestalt of this operation, and omits the detailed explanation.
[0069] In drawing 5 , the fixing unit 40 is equipped with a fixing roller 21, the pressurization roller 22, heaters 23 and 24, the bottom plate 25, the inner plate 26, and the fixing covering 41 grade, and, as for the fixing covering 41, many fins 42 for heat dissipation are formed all over the inside. The radiation fin 32 is formed in the direction in which air tends to flow in the inside of the fixing covering 41.
[0070] Therefore, according to the gestalt of this operation, in the heat generated with the fixing roller 21 and the pressurization roller 22 by the fin 42 for heat dissipation formed in the fixing covering 41 of the fixing unit 40, endoergic and when it carries out accumulation and cooling air flows in heat between endoergic and the fins 42 for heat dissipation which carried out accumulation, heat can be exhausted efficiently.
[0071] <Example of an experiment> The fixing unit 40 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the fixing unit of the same configuration of that the conventional fin for heat dissipation is not formed were conducted.
[0072] The experiment has arranged the thermocouple in the location which separated 10mm space to the upper part of fixing covering of the location which separated 10mm space to the upper part of the fixing covering 41 of the fixing unit 40 of the gestalt of this operation, and the conventional fixing unit, and carried out relative measurement of the temperature rise at the time of making fixing actuation perform.
[0073] Although the temperature of the location of 10mm of upper parts of fixing covering was 75 degrees C in the conventional fixing unit in which, as for the experimental result, a fin is not formed, no less than 20 degrees C of the temperature rise were lower than 55 degrees C and the conventional fixing unit in the fixing unit 40 of the gestalt of this operation. Therefore, by this experiment, accumulation was carried out, many fins 42 for heat dissipation exhausted heat by endoergic and the cooling air which flows between this fin 42 for heat dissipation, and it was checked that cooling effectiveness is high.
[0074] In addition, in the gestalt of implementation of the above 4th, the fixing covering 41 may be formed with the insulator using PTFE (poly tetrapod full ethylene) which is heat-resistant plastics, and the fin 42 for heat dissipation may be formed with the high copper alloy or aluminum-Mg alloy of thermal conductivity.
[0075] If it does in this way, while being able to control radiating heat in the device by which the heat generated from a fixing roller 21 and the pressurization roller 22 by the fixing covering 41 formed with heat insulating materials is applied to the fixing unit 40 And accumulation is carried out. the fin 42 for heat dissipation formed with the aluminum-Mg alloy with high thermal

conductivity etc. in the heat generated from the fixing roller 21 and the pressurization roller 22 -- efficient -- endoergic -- By the cooling air which passes the fin 42 for heat dissipation, endoergic and the heat which carried out accumulation can be efficiently exhausted on the fin 42 for heat dissipation.

[0076] <Example of an experiment> In the fixing unit 40 of the same configuration as the gestalt of implementation of the above 4th, the comparative experiments of the thermocouple were installed and carried out to the location of 10mm of upper parts of the fixing covering 41 by the case where the fixing covering 41 and the fin 42 for heat dissipation are constituted from a good aluminum containing alloy of heat conduction, and the case where formed the fixing covering 41 by PTFE of an insulator, and the fin 42 for heat dissipation is formed with the aluminum-Mg alloy of a high temperature conductivity ingredient.

[0077] Both experimental results were 75 degrees C, when the fixing covering 41 and the fin 42 for heat dissipation were constituted from an aluminum containing alloy, but they were PTFE about the fixing covering 41, and when the fin 42 for heat dissipation was constituted from an aluminum containing alloy, they were 45 degrees C.

[0078] Therefore, by setting the ingredient of the fixing covering 41 and the fin 42 for heat dissipation as a heat insulator and a high temperature conductivity ingredient, ambient temperature fell sharply and it was proved that reservation of dependability was secured enough.

[0079] As mentioned above, although invention made by this invention person was concretely explained based on the gestalt of suitable operation, it cannot be overemphasized that it can change variously in the range which this invention is not limited to the above-mentioned thing, and does not deviate from the summary.

[0080]

[Effect of the Invention] According to the exposure unit of invention according to claim 1, since the perimeter of an exposure lamp is established for the fin for heat dissipation in the exposure lamp of a wrap reflecting mirror, and the field of the opposite side, heat can be efficiently radiated through the fin for heat dissipation in the heat of a reflecting mirror, the temperature rise of a reflecting plate can be suppressed low, and the exposure lamp which is the light source of an exposure unit, and the reflecting mirror surrounding it can be cooled efficiently.

[0081] Since the fan who ventilates in air the fin for heat dissipation prepared in the reflecting plate is attached according to the exposure unit of invention according to claim 2, the fin for heat dissipation can be ventilated directly and effectively from a fan, the fin for heat dissipation and a reflecting plate can be cooled, and cooling effectiveness can be raised further.

[0082] Since the fin for cooling is arranged in parallel to the flow direction of the air which flows the perimeter of a reflecting mirror according to the exposure unit of invention according to claim 3, air can flow along the array side of the fin for heat dissipation, and cooling effectiveness can be raised further.

[0083] Since the fin for heat dissipation is prepared in the passage part of the air from the fan of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the fixing unit of invention according to claim 4 Heat can be radiated with the air from a fan which flows the fin for heat dissipation in the heat of fixing covering, the temperature of the front face of fixing covering can be reduced efficiently, and the thermal effect to a perimeter can be prevented.

[0084] While preparing the fin for heat dissipation in the field by the side of the fixing roller of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the fixing unit of invention according to claim 5 Since this fin for heat dissipation is ventilated from a fan, with the fin for heat dissipation prepared in the field by the

side of a fixing roller not only heat insulation but for heat dissipation using fixing covering The heating value which can cool with the air from a fan and is transmitted [heat / endoergic and / which carried out the collection of heat and was brought together in the fin for heat dissipation] outside from fixing covering in the excessive heat from a fixing roller can be decreased.
[0085] Since according to the fixing unit of invention according to claim 6 fixing covering is formed by the adiathermic good member and the fin for heat dissipation is formed by the member with good thermal conductivity, while being able to carry out a collection of heat, it can control further endoergic or that the heat from a fixing roller is transmitted outside with adiathermic fixing coverings, such as heat-resistant plastics, for surrounding heat with a much more sufficient response with the good fin for heat dissipation of the thermal conductivity of a copper alloy, an aluminium alloy, etc.

[Translation done.]

TECHNICAL FIELD

[Field of the Invention] This invention relates to the exposure unit and fixing unit which raised cooling effectiveness in the detail about an exposure unit and a fixing unit.

[Translation done.]

PRIOR ART

[Description of the Prior Art] In a copying machine, a laser beam printer, a scanner, etc., it has exoergic units, such as an exposure unit and a fixing unit, and it is an important problem how heat is radiated and the heat generated from these exoergic units is exhausted.
[0003] For example, a copying machine will be divided into the optical unit which used the lamp which reads a manuscript optically, the imaging unit which performs each process of electrification -> exposure -> development -> imprint -> electric discharge for a photo conductor, a development unit, the fixing unit which carries out welding of the toner in the copy paper to paper, and a pan by five units of a power supply unit if the unit configuration is divided roughly.
[0004] Only a fixing unit needs heat among these five units, heat occurs as a side effect and it is important for other units how heat is radiated and these generated heat is exhausted so that neither electronic parts nor process control may be affected.
[0005] In an optical unit, the reflecting plate arranged in the perimeter of a halogen lamp since the halogen lamp was generally used is heated by the exposure unit with a halogen lamp, the life of a halogen lamp is affected, or the metal side of a reflecting plate oxidizes, and the problem of the quantity of light irradiated by the manuscript decreasing arises.
[0006] Although the fan was attached and the whole exposure unit was cooled in order to cool an exposure unit conventionally, the hot spot where temperature is high cannot be cooled efficiently.
[0007] Moreover, the heat which the fixing unit needs has a thermal effect on surrounding passive circuit elements etc., or a fixing unit raises the temperature in [whole] a copying machine, and fault, such as having a bad influence on process control, produces it. Then, generally, although the heat exhaust air by the fan was performed or measures, such as heat insulation, were taken, effectiveness was not able to say conventionally that it was good too.
[0008] In addition, the conventional air-cooling method of general electronic equipment as indicated by JP,63-108800,A As passage is secured for the flow of the air of air supply and exhaust within a case, it cools or nature and forced-air cooling are indicated by JP,2-82693,A by making a case into a first-class way Having the inhalation means and ventilating fan for circulating air within and without a case, and forming a septum so that the flow of air may be made to separate, and cooling an equipment is performed.
[0009] Moreover, the technique of raising the cooling engine performance is indicated by JP,6-318124,A by centralizing a high heater element on one place, and connecting with the heat sink which turned and prepared them in the case exterior.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] According to the exposure unit of invention according to claim 1, since the perimeter of an exposure lamp is established for the fin for heat dissipation in the exposure lamp of a wrap reflecting mirror, and the field of the opposite side, heat can be efficiently radiated through the fin for heat dissipation in the heat of a reflecting mirror, the temperature rise of a reflecting plate can be suppressed low, and the exposure lamp which is the light source of an exposure unit, and the reflecting mirror surrounding it can be cooled efficiently.
[0081] Since the fan who ventilates in air the fin for heat dissipation prepared in the reflecting plate is attached according to the exposure unit of invention according to claim 2, the fin for heat dissipation can be ventilated directly and effectively from a fan, the fin for heat dissipation and a reflecting plate can be cooled, and cooling effectiveness can be raised further.
[0082] Since the fin for cooling is arranged in parallel to the flow direction of the air which flows the perimeter of a reflecting mirror according to the exposure unit of invention according to claim 3, air can flow along the array side of the fin for heat dissipation, and cooling effectiveness can be raised further.
[0083] Since the fin for heat dissipation is prepared in the passage part of the air from the fan of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the fixing unit of invention according to claim 4 Heat can be radiated with the air from a fan which flows the fin for heat dissipation in the heat of fixing covering, the temperature of the front face of fixing covering can be reduced efficiently, and the thermal effect to a perimeter can be prevented.
[0084] While preparing the fin for heat dissipation in the field by the side of the fixing roller of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the fixing unit of invention according to claim 5 Since this fin for heat dissipation is ventilated from a fan, with the fin for heat dissipation prepared in the field by the side of a fixing roller not only heat insulation but for heat dissipation using fixing covering The heating value which can cool with the air from a fan and is transmitted [heat / endoergic and / which carried out the collection of heat and was brought together in the fin for heat dissipation] outside from fixing covering in the excessive heat from a fixing roller can be decreased.
[0085] Since according to the fixing unit of invention according to claim 6 fixing covering is formed by the adiathermic good member and the fin for heat dissipation is formed by the member with good thermal conductivity, while being able to carry out a collection of heat, it can control further endoergic or that the heat from a fixing roller is transmitted outside with adiathermic fixing coverings, such as heat-resistant plastics, for surrounding heat with a much more sufficient response with the good fin for heat dissipation of the thermal conductivity of a copper alloy, an aluminium alloy, etc.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in addition in such a conventional cooling technique, it is not enough as a cooling technique of the device equipped with the exposure unit or the fixing unit.

[0011] Namely, although above-mentioned JP,63-108800,A and the conventional technique given in JP,2-82693,A can expect sufficient cooling effect when securing the airstream way which connects the inside and outside of a case in a case and cooling the whole case If it was in the device equipped with the exposure unit or the fixing unit, still more efficient cooling needed to be performed, the cooling effect to mean was not acquired and each above-mentioned conventional technique had problems -- sufficient cooling effect is not acquired by the rise of the exoergic consistency accompanying the miniaturization of a device.

[0012] Moreover, the conventional technique given [above-mentioned] in JP,6-318124,A is suitable when cooling the junction component of a substrate board with a heat sink, but when it has the exoergic unit as the configuration unit, in order that the part to cool may attain to the whole unit like a copying machine, it does not serve as sufficient solution means.

[0013] It is important for a copying machine, a laser beam printer, a scanner, etc. that there is a unit for which the configuration unit uses heat like a fixing unit especially unlike a computer and other electronic equipment, and a unit with large calorific value also cools a thermal design intricately and efficiently like an exposure unit for a certain reason.

[0014] Furthermore, recently, the miniaturization of a device progresses, a downsizing design is performed also for each unit of a device, and by this miniaturization, while the exoergic consistency of each unit rises, reservation of the space which a case dimension spares for installation of a cooling fan by becoming small, and cooling passage is becoming difficult.

[0015] Then, by establishing the perimeter of an exposure lamp for the fin for heat dissipation in the exposure lamp of a wrap reflecting mirror, and the field of the opposite side, invention according to claim 1 radiates heat efficiently through the fin for heat dissipation in the heat of a reflecting mirror, suppresses the temperature rise of a reflecting plate low, and aims at offering the exposure unit which cools efficiently the exposure lamp which is the light source of an exposure unit, and the reflecting mirror surrounding it.

[0016] Invention according to claim 2 ventilates the fin for heat dissipation directly and effectively from a fan by ****** with picking in the fan who ventilates in air the fin for heat dissipation prepared in the reflecting plate, cools the fin for heat dissipation, and aims at offering the exposure unit which can raise cooling effectiveness further.

[0017] By arranging the fin for cooling in parallel to the flow direction of the air which flows the perimeter of a reflecting mirror, invention according to claim 3 aims at offering the exposure unit which can raise cooling effectiveness further, as air flows along the array side of the fin for heat dissipation.

[0018] Invention according to claim 4 by carrying out the pressure welding of a fixing roller and the pressurization roller, and preparing the fin for heat dissipation in the passage part of the air from the fan of the fixing covering of the fixing unit with which the fixing roller was covered with fixing covering concerned Heat is radiated with the air from a fan which flows the fin for heat dissipation in the heat of fixing covering, the temperature of a fixing covering front face is reduced efficiently, and it aims at offering the fixing unit which can prevent the thermal effect to a perimeter.

[0019] While invention according to claim 5 prepares the fin for heat dissipation in the field by the side of the fixing roller of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned With the fin for heat dissipation prepared in the field by the side of a fixing roller not only heat insulation but for heat dissipation by ventilating this fin

for heat dissipation from a fan using fixing covering It aims at offering the fixing unit which can decrease the heating value which cools with the air from a fan and is transmitted [heat / endoergic and / which carried out the collection of heat and was brought together in the fin for heat dissipation] outside from fixing covering in the excessive heat from a fixing roller.
[0020] By invention according to claim 6 forming fixing covering by the adiathermic good member, and forming the fin for heat dissipation by the member with good thermal conductivity the good fin for heat dissipation of the thermal conductivity of a copper alloy, an aluminium alloy, etc. -- surrounding heat -- more -- much more -- a response -- good -- endoergic -- or, while carrying out a collection of heat It aims at offering the fixing unit which can control further that the heat from a fixing roller is transmitted outside with adiathermic fixing coverings, such as heat-resistant plastics.

[Translation done.]

MEANS

[Means for Solving the Problem] The exposure unit of invention according to claim 1 has attained the above-mentioned purpose by being the exposure unit equipped with the predetermined distance detached building ****** reflecting mirror from the exposure lamp concerned, and preparing the fin for heat dissipation in said exposure lamp of said reflecting mirror, and the field of the opposite side in the predetermined range around the exposure lamp which irradiates light at a manuscript, and said exposure lamp.

[0022] According to the above-mentioned configuration, since the perimeter of an exposure lamp is established for the fin for heat dissipation in the exposure lamp of a wrap reflecting mirror, and the field of the opposite side, heat can be efficiently radiated through the fin for heat dissipation in the heat of a reflecting mirror, the temperature rise of a reflecting plate can be suppressed low, and the exposure lamp which is the light source of an exposure unit, and the reflecting mirror surrounding it can be cooled efficiently.

[0023] The fan by whom said reflecting mirror ventilates said fin for heat dissipation in air may be attached so that it may indicate to claim 2 in this case.

[0024] Since the fan who ventilates in air the fin for heat dissipation prepared in the reflecting plate is attached according to the above-mentioned configuration, the fin for heat dissipation can be ventilated directly and effectively from a fan, the fin for heat dissipation and a reflecting plate can be cooled, and cooling effectiveness can be raised further.

[0025] Moreover, for example, said fin for cooling may be arranged in parallel to the flow direction of the air which flows the perimeter of said reflecting mirror so that it may indicate to claim 3.

[0026] Since the fin for cooling is arranged in parallel to the flow direction of the air which flows the perimeter of a reflecting mirror according to the above-mentioned configuration, air can flow along the array side of the fin for heat dissipation, and cooling effectiveness can be raised further.

[0027] The fixing roller by which the fixing unit of invention according to claim 4 is heated at a heater, and a rotation drive is carried out, The pressurization roller which a pressure welding is carried out to said fixing roller, and rotates with said fixing roller, At least said pressurization roller and opposite side of said fixing roller Wrap fixing covering, It is the fixing unit equipped with the fan who ventilates the perimeter of said fixing covering in air, and the above-mentioned purpose is attained by preparing the fin for heat dissipation in the passage part of the air from said fan of said fixing covering at least.

[0028] Since the fin for heat dissipation has been prepared in the passage part of the air from the fan of the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the above-mentioned configuration, heat can be radiated by the air from a fan which flows the fin for heat dissipation in the heat of fixing covering, the temperature of the front face of fixing covering can be reduced efficiently, and the thermal effect to a perimeter can be prevented.

[0029] The fixing roller by which the fixing unit of invention according to claim 5 is heated at a heater, and a rotation drive is carried out, The pressurization roller which a pressure welding is carried out to a fixing fixing roller, and rotates with a fixing fixing roller, At least said pressurization roller and opposite side of said fixing roller Wrap fixing covering, It is the fixing unit equipped with the fan who ventilates the perimeter of said fixing covering in air, and the fin for heat dissipation was prepared in the field by the side of said fixing roller of said fixing covering, and the above-mentioned purpose is attained by turning said fan's ventilation direction to the fin for heat dissipation concerned.

[0030] While preparing the fin for heat dissipation in the field by the side of the fixing roller of

the fixing covering of the fixing unit with which the pressure welding of a fixing roller and the pressurization roller was carried out, and the fixing roller was covered with fixing covering concerned according to the above-mentioned configuration Since this fin for heat dissipation is ventilated from a fan, with the fin for heat dissipation prepared in the field by the side of a fixing roller not only heat insulation but for heat dissipation using fixing covering The heating value which can cool with the air from a fan and is transmitted [heat / endoergic and / which carried out the collection of heat and was brought together in the fin for heat dissipation] outside from fixing covering in the excessive heat from a fixing roller can be decreased.

[0031] Said fixing covering may be formed by the adiathermic good member, and said fin for heat dissipation may be formed by the member with good thermal conductivity so that it may indicate to claim 6 in this case.

[0032] Since according to the above-mentioned configuration fixing covering is formed by the adiathermic good member and the fin for heat dissipation is formed by the member with good thermal conductivity, while being able to carry out a collection of heat, it can control further endoergic or that the heat from a fixing roller is transmitted outside with adiathermic fixing coverings, such as heat-resistant plastics, for surrounding heat with a much more sufficient response with the good fin for heat dissipation of the thermal conductivity of a copper alloy, an aluminium alloy, etc.

[0033]

[Embodiment of the Invention] Hereafter, the gestalt of suitable operation of this invention is explained to a detail based on an accompanying drawing. In addition, since the gestalt of the operation described below is a gestalt of suitable operation of this invention, desirable various limitation is attached technically, but especially the range of this invention is not restricted to these modes, as long as there is no publication of the purport which limits this invention in the following explanation.

[0034] Drawing 1 is drawing showing the gestalt of operation of the 1st of the exposure unit of this invention, and the gestalt of this operation corresponds to claim 1 and claim 3. Drawing 1 is the side-face sectional view of the exposure unit 1 which applied the gestalt of operation of the 1st of the exposure unit of this invention.

[0035] In drawing 1 , the exposure unit 1 is equipped with the halogen lamp 2 and reflecting plate 3 as the light source, and air is ventilated by the field of drawing 1 in the direction of a vertical from the fan who does not illustrate to the exposure unit 1.

[0036] According to manuscript reading width of face, the halogen lamp 2 has predetermined die length, and irradiates light at the manuscript which is not illustrated. The light reflected with this manuscript is introduced into optoelectric transducers (for example, CCD (Charge Coupled Device) etc.) through the optical system of the 1st mirror 4 and others, and is changed into image data by the optoelectric transducer.

[0037] Predetermined spacing detached building ****** of the reflecting plate 3 is carried out with the halogen lamp 2, the field by the side of a halogen lamp 2 is formed in an about U character mold, and it is polished in the mirror plane. The fin 5 for heat dissipation projected to the method of outside is formed in the halogen lamp 2 of a reflecting plate 3, and the external surface of the opposite side from the external surface concerned of a reflecting plate 3, and the fin 5 for heat dissipation is formed all over the external surface of a reflecting plate 3. Each fin 5 for heat dissipation is formed in the direction perpendicular to the field of drawing 1 for a long time, and is arranged in parallel in the ventilation direction from the above-mentioned fan. The reflecting plate 3 and the fin 5 for heat dissipation are formed by a member with both good thermal conductivity, for example, an aluminum containing alloy.

[0038] Next, actuation of the gestalt of this operation is explained. If a halogen lamp 2 is turned on at the time of actuation, a halogen lamp 2 will generate heat and, as for the exposure unit 1, a reflecting plate 3 will be heated by generation of heat of a halogen lamp 2. However, the fin 5

for heat dissipation is formed in the reflecting plate 3, and air is ventilated from a direction perpendicular to the space of drawing 1 from the fan who does not illustrate at a reflecting plate 3 and the fin 5 for heat dissipation. Therefore, the heat of a reflecting plate 3 can radiate heat efficiently through the fin 5 for heat dissipation with a fan's air ventilated by the fin 5 for heat dissipation, and can control the temperature rise of a reflecting plate 3.
[0039] Moreover, since the fin 5 for heat dissipation is arranged in parallel with the flow of the air from a fan and is formed, the air from a fan can flow between the fins 5 for heat dissipation along with the fin 5 for heat dissipation, and it can radiate heat much more efficiently from the fin 5 for heat dissipation.
[0040] <Example of an experiment> The exposure unit 1 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the conventional exposure unit of only the reflecting plate with which the fin for heat dissipation is not formed were conducted.
[0041] In order for an experiment to stick a thermocouple, respectively the inside of the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation, and inside the reflecting plate of the conventional exposure unit and not to saturate a temperature rise, the line performed the temperature comparison of the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation with which the thermocouple at that time detected continuation copy actuation by 100 sheets, and the reflecting plate of the conventional exposure unit. In addition, both the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation and the reflecting plate of the conventional exposure unit are formed of aluminum in this case.
[0042] In the conventional exposure unit to which, as for the experimental result, a fin is not attached, the rise temperature (increment from a room temperature) of a reflecting plate was as high as 50 degrees C, and fault had produced the reflecting plate made from aluminum also for mechanical precision -- when it becomes cloudy locally by scaling or an exposure unit scans, a squeak carries out.
[0043] On the other hand, if it was in the exposure unit 1 of the gestalt of this operation, rise temperature was as low as 35 degrees C, and faults by oxidation of the front face of the reflecting plate 3 which had been produced conventionally, such as local nebula and a squeak, were canceled. Therefore, it was checked by forming the fin 5 for heat dissipation in the front face of a reflecting plate 3 that the cooling effect is improving.
[0044] Drawing 2 is drawing showing the gestalt of operation of the 2nd of the exposure unit of this invention, and the gestalt of this operation corresponds to claim 2 and claim 3.
[0045] In addition, the gestalt of this operation is applied to the same exposure unit as the gestalt of implementation of the above 1st, gives the same sign to the same component as the exposure unit of the gestalt of implementation of the above 1st in explanation of the gestalt of this operation, and omits the detailed explanation.
[0046] In drawing 2 , the exposure unit 10 is equipped with the halogen lamp 2, the reflecting plate 3, and fan 11 who do not illustrate, and the fin 5 for heat dissipation is formed in the reflecting plate 3.
[0047] The fan 11 is attached in the one side side face (left-hand side side face of drawing 21) of a reflecting plate 3, and ventilates air toward a reflecting plate 3 and a halogen lamp 2. That is, the fan 11 is attached in the reflecting plate 3 with which the fin 5 was formed as one. The fin 5 for heat dissipation currently formed in the reflecting plate 3 is formed in parallel along the flow direction of the air from a fan 11, and the air ventilated by the fan 11 flows along with a fin 5. That to which the thing of 40mmx40mm and t= 10mm thickness is used, and this fan 11 operates with the direct current voltage (DC) of 12 [V] and the current of 80 [mA] is used. The rotation drive of the fan 11 is carried out synchronizing with lighting actuation of a halogen lamp 2.
[0048] Therefore, since according to the gestalt of this operation the fan 11 is attached while

forming the fin 5 for heat dissipation in a reflecting plate 3, while carrying out air cooling of a halogen lamp and the reflecting plate 3 with the air from a fan 11, the heat of a reflecting plate 3 can be made to be able to radiate heat much more efficiently through the fin 5 for heat dissipation, and the temperature rise of a reflecting plate 3 can be controlled further. Since the fin 5 for heat dissipation is especially arranged along a fan's 11 ventilation direction, the air from a fan 11 can flow between the fins 5 for heat dissipation along with the fin 5 for heat dissipation, and can radiate heat much more efficiently from the fin 5 for heat dissipation in the heat of a reflecting plate 3.

[0049] <Example of an experiment> The exposure unit 10 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the conventional exposure unit of only the reflecting plate with which the fin for heat dissipation is not formed were conducted.

[0050] In order for an experiment to stick a thermocouple on the reflecting plate of the inside of the reflecting plate 3 of the exposure unit 10 of the gestalt of this operation, and the conventional exposure unit, respectively and not to saturate a temperature rise, the line performed the temperature comparison of the reflecting plate 3 of the exposure unit 1 of the gestalt of this operation with which the thermocouple at that time detected continuation copy actuation by 100 sheets, and the reflecting plate of the conventional exposure unit. In addition, both the reflecting plate 3 of the exposure unit 10 of the gestalt of this operation and the reflecting plate of the conventional exposure unit are formed of aluminum in this case.

[0051] In the conventional exposure unit to which, as for the experimental result, a fin is not attached, the rise temperature (increment from a room temperature) of a reflecting plate was as high as 50 degrees C like the above-mentioned example of an experiment, and fault had produced the reflecting plate made from aluminum also for mechanical precision -- when it becomes cloudy locally by scaling or an exposure unit scans, a squeak carries out.

[0052] On the other hand, if it was in the exposure unit 10 of the gestalt of this operation, rise temperature was still lower than the exposure unit 1 of the gestalt of implementation of 25 degrees C and the above 1st, and while faults by oxidization of the front face of the reflecting plate 3 which had been produced conventionally, such as local nebula and a squeak, were canceled, Bure of images, such as a jitter, was canceled. Therefore, while forming the fin 5 for heat dissipation in the reflecting plate 3, it was checked by ventilating the reflecting plate 3 with which the fin 5 for heat dissipation was formed from the fan 11 that the cooling effect is improving further.

[0053] In addition, in the gestalt of this operation, although the fan 11 is attached in the left end side of the reflecting plate 3 of drawing 2 , a fan 11 may attach in the right end side of a reflecting plate 3, and may attach a fan 11 in each right and left of a reflecting plate 3 according to the magnitude of a temperature rise, and may use it by the push pull.

[0054] Moreover, in the gestalt of the above 1st and the 2nd implementation, although the fin 5 for heat dissipation is arranged in parallel with the longitudinal direction of a reflecting plate 3, the array direction of the fin 5 for heat dissipation may not be restricted to what is arranged to the longitudinal direction of a reflecting plate 3, and may be formed according to the flow direction of the air ventilated by the reflecting plate 3 from an external fan or the fan 11 attached in the reflecting plate 3. For example, as shown in drawing 3 , when the airstream from an external fan or the fan 11 attached in the reflecting plate 3 flows in the direction of a short hand of a reflecting plate 3 (direction shown by the arrow head of drawing 3), the fin 12 for heat dissipation is formed in the direction of a short hand of the reflecting plate 3 with which the airstream concerned flows.

[0055] In addition, as shown in drawing 3 , the fin 12 for heat dissipation was formed, and when carried out like the example of an experiment which explained the experiment of the temperature rise of an exposure unit with the gestalt of implementation of the above 1st by the

ventilation only from an external fan, the rise temperature of a reflecting plate 3 was suppressed by 30 degrees C.
[0056] Drawing 4 is drawing showing the gestalt of operation of the 3rd of the fixing unit of this invention, and the gestalt of this operation corresponds to claim 4. Drawing 4 is the side-face sectional view of the fixing unit 20 which applied the gestalt of operation of the 3rd of the fixing unit of this invention.
[0057] In drawing 4 , the heaters 23 and 24 at which the pressure welding of the fixing roller 21 and the pressurization roller 22 with which the rotation drive of the fixing unit 20 is carried out is carried out, and they heat a fixing roller 21 and the pressurization roller 22 on a fixing roller 21 and the pressurization roller 22, respectively are built in.
[0058] The lower part of the pressurization roller 22 is covered with the bottom plate 25, and while the inner plate 26 is arranged, the fixing covering 27 is arranged in the upper part of a fixing roller 21 so that the upper part of an inner plate 26 and the right-and-left both sides of a fixing roller 21 may be covered. Two or more fins 28 for heat dissipation are formed in the left-hand side external surface of the fixing covering 27, and the fin 28 for heat dissipation is formed in it to the space of drawing 4 in the condition of extending for a long time to predetermined die length, for example, 350mm, covering the direction of a vertical. Cooling air is ventilated from the external fan who does not illustrate by the part in which the fin 28 for heat dissipation of the fixing covering 27 is formed.
[0059] The recording paper with which the feed guide 29 adhered to the toner image is conveyed by the pressure-welding section of a fixing roller 21 and the pressurization roller 22, the toner image in the record paper is fixed to the recording paper with the fixing roller 21 and the pressurization roller 22 which are heated at heaters 23 and 24, and the delivery guide 30 top is discharged on the paper output tray outside drawing.
[0060] Next, actuation of the gestalt of this operation is explained. A fixing unit 20 is in the condition that the fixing roller 21 was heated at the heater 23, and the pressurization roller 22 was heated at the heater 24, if the recording paper which adhered the feed guide 29 top to the toner image is conveyed by the pressure-welding section of a fixing roller 21 and the pressurization roller 22, carries out the welding of the toner in the record paper to the recording paper with the heated fixing roller 21 and the pressurization roller 22, and will discharge a delivery guide 30 top for the recording paper which fixing completed.
[0061] At this time, the wrap fixing covering 27 is heated in a fixing roller 21 by the heat which radiates heat from the fixing roller 21 heated at the pressurization roller 24 and heater 23 which are heated at a heater 22.
[0062] However, to the fixing covering 27, it can prevent that can radiate for it heat and exhaust the heat of the fixing covering 27 efficiently from a radiation fin 28 into it, and the fixing covering 27 is overheated since the fin 28 for heat dissipation is formed in the part by which the cooling air from the external fan is ventilated. That is, since heat required in order to carry out welding of the toner exerts a side effect on the unit around a device, efficient exhaust heat can be performed by combining the flow and the fin 28 for heat dissipation of air inside the plane for heat other than the need the optimal.
[0063] <Example of an experiment> The fixing unit 20 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the fixing unit of the same configuration of that the conventional fin for heat dissipation is not formed were conducted.
[0064] The experiment stuck the thermocouple on the top face of the fixing covering 27 of the fixing unit 20 of the gestalt of this operation, and the top face of fixing covering of the conventional fixing unit, and carried out relative measurement of the temperature rise at the time of making fixing actuation perform.
[0065] There was little effectiveness which it cools in case an experimental result flows the

side face of fixing covering in which the flow of the air from an external fan was formed in the flat surface, in the conventional fixing unit in which a fin is not formed, therefore the temperature of fixing covering was rising also at 105 degrees C.
[0066] On the other hand, in the fixing unit 20 of the gestalt of this operation, the temperature rise was to 85 degrees C. Therefore, in order that air might flow between many fins 28 for heat dissipation, it was checked that cooling effectiveness is high.
[0067] Drawing 5 is drawing showing the gestalt of operation of the 4th of the fixing unit of this invention, and the gestalt of this operation corresponds to claim 5 and claim 6.
[0068] In addition, the gestalt of this operation is applied to the same fixing unit as the gestalt of implementation of the above 3rd, gives the same sign to the same component as the fixing unit of the gestalt of implementation of the above 3rd in explanation of the gestalt of this operation, and omits the detailed explanation.
[0069] In drawing 5 , the fixing unit 40 is equipped with a fixing roller 21, the pressurization roller 22, heaters 23 and 24, the bottom plate 25, the inner plate 26, and the fixing covering 41 grade, and, as for the fixing covering 41, many fins 42 for heat dissipation are formed all over the inside. The radiation fin 32 is formed in the direction in which air tends to flow in the inside of the fixing covering 41.
[0070] Therefore, according to the gestalt of this operation, in the heat generated with the fixing roller 21 and the pressurization roller 22 by the fin 42 for heat dissipation formed in the fixing covering 41 of the fixing unit 40, endoergic and when it carries out accumulation and cooling air flows in heat between endoergic and the fins 42 for heat dissipation which carried out accumulation, heat can be exhausted efficiently.
[0071] <Example of an experiment> The fixing unit 40 of the gestalt of the above-mentioned implementation was used, and the comparative experiments of the cooling effect with the fixing unit of the same configuration of that the conventional fin for heat dissipation is not formed were conducted.
[0072] The experiment has arranged the thermocouple in the location which separated 10mm space to the upper part of fixing covering of the location which separated 10mm space to the upper part of the fixing covering 41 of the fixing unit 40 of the gestalt of this operation, and the conventional fixing unit, and carried out relative measurement of the temperature rise at the time of making fixing actuation perform.
[0073] Although the temperature of the location of 10mm of upper parts of fixing covering was 75 degrees C in the conventional fixing unit in which, as for the experimental result, a fin is not formed, no less than 20 degrees C of the temperature rise were lower than 55 degrees C and the conventional fixing unit in the fixing unit 40 of the gestalt of this operation. Therefore, by this experiment, accumulation was carried out, many fins 42 for heat dissipation exhausted heat by endoergic and the cooling air which flows between this fin 42 for heat dissipation, and it was checked that cooling effectiveness is high.
[0074] In addition, in the gestalt of implementation of the above 4th, the fixing covering 41 may be formed with the insulator using PTFE (poly tetrapod full ethylene) which is heat-resistant plastics, and the fin 42 for heat dissipation may be formed with the high copper alloy or aluminum-Mg alloy of thermal conductivity.
[0075] If it does in this way, while being able to control radiating heat in the device by which the heat generated from a fixing roller 21 and the pressurization roller 22 by the fixing covering 41 formed with heat insulating materials is applied to the fixing unit 40 And accumulation is carried out. the fin 42 for heat dissipation formed with the aluminum-Mg alloy with high thermal conductivity etc. in the heat generated from the fixing roller 21 and the pressurization roller 22 -- efficient -- endoergic -- By the cooling air which passes the fin 42 for heat dissipation, endoergic and the heat which carried out accumulation can be efficiently exhausted on the fin 42 for heat dissipation.

[0076] <Example of an experiment> In the fixing unit 40 of the same configuration as the gestalt of implementation of the above 4th, the comparative experiments of the thermocouple were installed and carried out to the location of 10mm of upper parts of the fixing covering 41 by the case where the fixing covering 41 and the fin 42 for heat dissipation are constituted from a good aluminum containing alloy of heat conduction, and the case where formed the fixing covering 41 by PTFE of an insulator, and the fin 42 for heat dissipation is formed with the aluminum-Mg alloy of a high temperature conductivity ingredient.
[0077] Both experimental results were 75 degrees C, when the fixing covering 41 and the fin 42 for heat dissipation were constituted from an aluminum containing alloy, but they were PTFE about the fixing covering 41, and when the fin 42 for heat dissipation was constituted from an aluminum containing alloy, they were 45 degrees C.
[0078] Therefore, by setting the ingredient of the fixing covering 41 and the fin 42 for heat dissipation as a heat insulator and a high temperature conductivity ingredient, ambient temperature fell sharply and it was proved that reservation of dependability was secured enough.
[0079] As mentioned above, although invention made by this invention person was concretely explained based on the gestalt of suitable operation, it cannot be overemphasized that it can change variously in the range which this invention is not limited to the above-mentioned thing, and does not deviate from the summary.

[Translation done.]

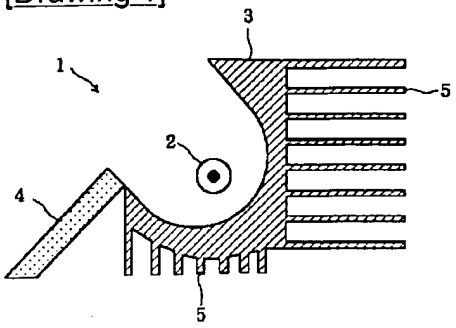
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The side-face sectional view of the exposure unit which applied the gestalt of operation of the 1st of the exposure unit of this invention.
[Drawing 2] The perspective view of the exposure unit which applied the gestalt of operation of the 2nd of the exposure unit of this invention.
[Drawing 3] The perspective view of the reflecting plate in which the example which changed the formation direction of the fin for heat dissipation is shown.
[Drawing 4] The side-face sectional view of the fixing unit which applied the gestalt of operation of the 3rd of the fixing unit of this invention.
[Drawing 5] The side-face sectional view of the fixing unit which applied the gestalt of operation of the 4th of the fixing unit of this invention.
[Description of Notations]
1 Exposure Unit
2 Halogen Lamp
3 Reflecting Plate
4 1st Mirror
5 12 Fin for heat dissipation
10 Exposure Unit
11 Fan
20 Fixing Unit
21 Fixing Roller
22 Pressurization Roller
23 24 Heater
25 Bottom Plate
26 Inner Plate
27 Fixing Covering
28 Fin for Heat Dissipation
29 Feed Guide
30 Delivery Guide
40 Fixing Unit
41 Fixing Covering
42 Fin for Heat Dissipation

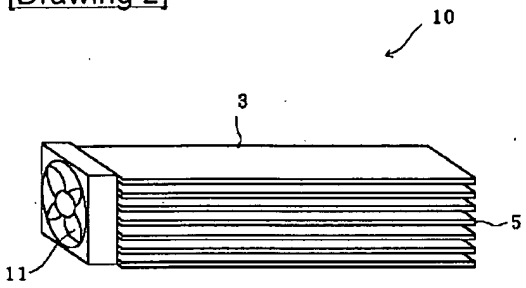
[Translation done.]

DRAWINGS

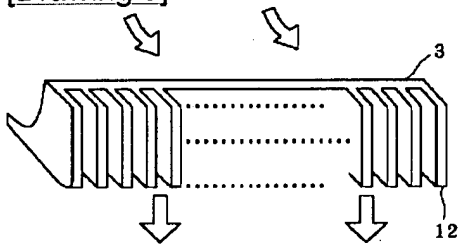
[Drawing 1]



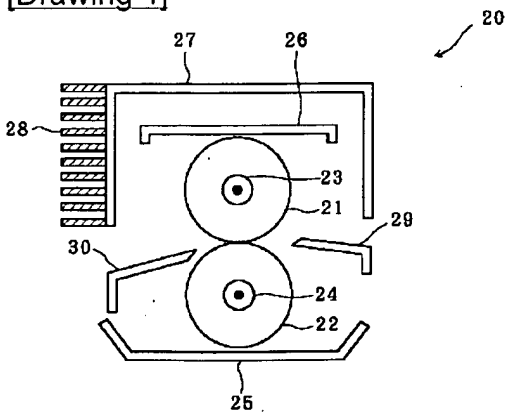
[Drawing 2]



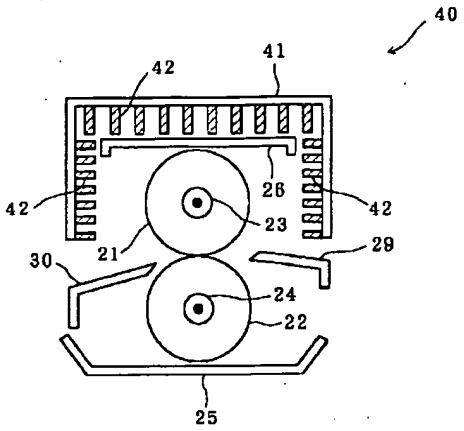
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]

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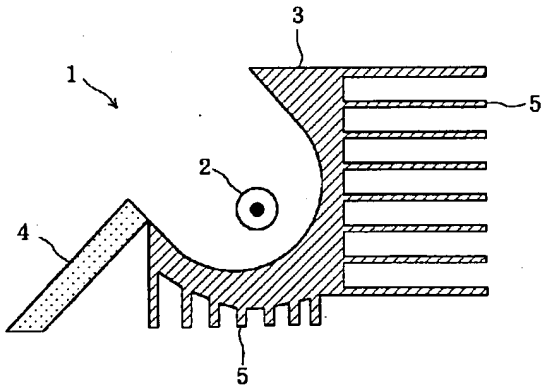
(54)【発明の名称】　露光ユニット及び定着ユニット

(57)【要約】
【課題】本発明は冷却用フィンを設けることにより冷却効率を向上させた露光ユニット及び定着ユニットを提供する。
【解決手段】露光ユニット１は、動作時、ハロゲンランプ２が点灯されることにより発熱し、ハロゲンランプ２の発熱により反射板３が加熱される。反射板３には、放熱用フィン５が形成されており、反射板３及び放熱用フィン５には、ファンから放熱用フィン５の配設方向に沿って空気が送風される。反射板３の熱は、放熱用フィン５に送風されるファンの空気により放熱用フィン５を介して効率的に放熱され、反射板３の温度上昇を抑制することができる。



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【特許請求の範囲】
【請求項1】原稿に光を照射する露光ランプと、前記露光ランプの周囲の所定範囲を当該露光ランプから所定距離離れて覆う反射鏡と、を備えた露光ユニットであって、前記反射鏡の前記露光ランプと反対側の面に放熱用フィンが設けられていることを特徴とする露光ユニット。
【請求項2】前記反射鏡は、前記放熱用フィンに空気を送風するファンが取り付けられていることを特徴とする請求項1記載の露光ユニット。
【請求項3】前記冷却用フィンは、前記反射鏡の周囲を流れる空気の流れの方向に対して平行に配設されていることを特徴とする請求項1及び請求項2記載の露光ユニット。
【請求項4】ヒーターにより加熱され回転駆動される定着ローラと、前記定着ローラに圧接され前記定着ローラとともに回転する加圧ローラと、少なくとも前記定着ローラの前記加圧ローラと反対側を覆う定着カバーと、前記定着カバーの周囲に空気を送風するファンと、を備えた定着ユニットであって、少なくとも前記定着カバーの前記ファンからの空気の通過部分に放熱用フィンが設けられていることを特徴とする定着ユニット。
【請求項5】ヒーターにより加熱され回転駆動される定着ローラと、定着定着ローラに圧接され定着定着ローラとともに回転する加圧ローラと、少なくとも前記定着ローラの前記加圧ローラと反対側を覆う定着カバーと、前記定着カバーの周囲に空気を送風するファンと、を備えた定着ユニットであって、前記定着カバーの前記定着ローラ側の面に放熱用フィンが設けられ、前記ファンの送風方向が当該放熱用フィンに向けられていることを特徴とする定着ユニット。
【請求項6】前記定着カバーは、断熱性の良好な部材で形成され、前記放熱用フィンは、熱伝導率の良好な部材で形成されていることを特徴とする請求項5記載の定着ユニット。
【発明の詳細な説明】
【0001】
【発明の属する技術分野】本発明は、露光ユニット及び定着ユニットに関し、詳細には、冷却効率を向上させた露光ユニット及び定着ユニットに関する。
【0002】
【従来の技術】複写機、レーザープリンタ及びスキャナ等においては、露光ユニットや定着ユニット等の発熱ユニットを備えており、これらの発熱ユニットから発生される熱をいかに放熱、排熱するかが重要な問題である。
【0003】例えば、複写機は、そのユニット構成を大別すると、原稿を光学的に読み取るランプを使用した光学ユニット、感光体を帯電→露光→現像→転写→除電の各プロセスを行う作像ユニットと現像ユニット、コピー紙上のトナーを紙に融着させる定着ユニット、さらに、

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電源ユニットの5つのユニットに分けられる。
【0004】この5つのユニットのうち、熱を必要とするのは、定着ユニットだけであって、その他のユニットは、副作用として熱が発生し、これらの発生された熱を電子部品やプロセス制御にいかに影響を与えないように、放熱、排熱するかが重要である。
【0005】光学ユニットでは、その露光ユニットに、一般に、ハロゲンランプを使用しているため、ハロゲンランプの周囲に配設された反射板がハロゲンランプにより加熱されて、ハロゲンランプの寿命に影響を与えたり、反射板の金属面が酸化して、原稿に照射される光量が減少する等の問題が生じる。
【0006】従来、露光ユニットを冷却するために、ファンを取り付けて露光ユニット全体を冷却していたが、温度の高いホットスポットを効率よく冷却することができない。
【0007】また、定着ユニットは、定着ユニットが必要としている熱が周囲の回路部品等に熱影響を及ぼしたり、複写機内の全体の温度を上昇させ、プロセス制御に悪影響を及ぼす等の不具合が生じる。そこで、従来、一般に、ファンによる熱排気を行ったり、断熱等の対策が施されているが、やはり効率が良いとはいえなかった。
【0008】なお、従来の電子機器一般の空冷法は、例えば、特開昭63－108800号公報に記載されているように、自然、強制空冷とも、給排気の空気の流れを筐体内で流路を確保して、筐体を一流路として冷却を行ったり、特開平2－82693号公報に記載されているように、筐体内外に空気を流通させるための吸入手段と排気ファンを備え、かつ、空気の流れを分離させるように隔壁を設けて機器類を冷却することが行われている。
【0009】また、特開平6－318124号公報には、高発熱素子を1カ所に集中させ、それらを筐体外部へ向けて設けたヒートシンクに接続することにより、冷却性能を向上させる技術が開示されている。
【0010】
【発明が解決しようとする課題】しかしながら、このような従来の冷却技術においては、露光ユニットや定着ユニットを備えた機器の冷却技術としては、なお十分ではない。
【0011】すなわち、上記特開昭63－108800号公報及び特開平2－82693号公報記載の従来技術は、筐体内に筐体内外をつなぐ空気流路を確保して、筐体全体の冷却を行う場合には、十分な冷却効果を期待できるが、露光ユニットや定着ユニットを備えた機器にあっては、さらに効率的な冷却を行う必要があり、上記従来技術は、いずれも意図する冷却効果が得られなかったり、機器の小型化に伴う発熱密度の上昇によって、十分な冷却効果が得られない等の問題があった。
【0012】また、上記特開平6－318124号公報記載の従来技術は、基板ボードのジャンクション素子を

ヒートシンクで冷却する場合には、適しているが、複写機等のように、発熱ユニットをその構成ユニットとして備えている場合には、冷却する部分がユニット全体に及ぶため、十分な解決手段とはならない。

【００１３】特に、複写機、レーザープリンタ及びスキャナ等は、その構成ユニットがコンピュータやその他の電子機器とは異なり、定着ユニットのように熱を利用するユニットがあり、また、露光ユニットのように発熱量の大きいユニットもあるため、熱設計も複雑で効率よく冷却することが重要である。

【００１４】さらに、近時、機器の小型化が進み、機器の各ユニットもダウンサイジング設計が行われ、この小型化により、各ユニットの発熱密度が上昇するとともに、筐体寸法が小さくなり、冷却ファンの設置に割く空間と冷却流路の確保が困難になってきている。

【００１５】そこで、請求項１記載の発明は、露光ランプの周囲を覆う反射鏡の露光ランプと反対側の面に放熱用フィンを設けることにより、反射鏡の熱を放熱用フィンを介して効率的に放熱して、反射板の温度上昇を低く抑え、露光ユニットの光源である露光ランプとそれを囲む反射鏡を効率よく冷却する露光ユニットを提供することを目的としている。

【００１６】請求項２記載の発明は、反射板に設けた放熱用フィンに空気を送風するファンを取り付けることにより、ファンから放熱用フィンに直接かつ効果的に送風して、放熱用フィンを冷却し、冷却効率をより一層向上させることのできる露光ユニットを提供することを目的としている。

【００１７】請求項３記載の発明は、冷却用フィンを反射鏡の周囲を流れる空気の流れの方向に対して平行に配設することにより、放熱用フィンの配列面に沿って空気が流れるようにして、冷却効率をより一層向上させることのできる露光ユニットを提供することを目的としている。

【００１８】請求項４記載の発明は、定着ローラと加圧ローラが圧接され、定着ローラが定着カバーにより覆われた定着ユニットの当該定着カバーのファンからの空気の通過部分に、放熱用フィンを設けることにより、定着カバーの熱を放熱用フィンを流れるファンからの空気により放熱し、定着カバー表面の温度を効率的に低下させて、周囲への熱影響を防止することのできる定着ユニットを提供することを目的としている。

【００１９】請求項５記載の発明は、定着ローラと加圧ローラが圧接され、定着ローラが定着カバーにより覆われた定着ユニットの当該定着カバーの定着ローラ側の面に、放熱用フィンを設けるとともに、ファンからこの放熱用フィンに送風することにより、定着カバーを、断熱だけでなく、放熱用に利用して、定着ローラ側の面に設けた放熱用フィンにより、定着ローラからの余分な熱を吸熱・集熱し、放熱用フィンに集められた熱をファンからの空気で冷却して、定着カバーから外側に伝達される熱量を減少させることのできる定着ユニットを提供することを目的としている。

【００２０】請求項６記載の発明は、定着カバーを断熱性の良好な部材で形成し、放熱用フィンを熱伝導率の良好な部材で形成することにより、銅合金、アルミニウム合金等の熱伝導率の良好な放熱用フィンにより周囲の熱をより一層レスポンス良く吸熱あるいは集熱するとともに、耐熱性のプラスチック等の断熱性の定着カバーにより定着ローラからの熱が外側へ伝達されるのをより一層抑制することのできる定着ユニットを提供することを目的としている。

【００２１】

【課題を解決するための手段】請求項１記載の発明の露光ユニットは、原稿に光を照射する露光ランプと、前記露光ランプの周囲の所定範囲を当該露光ランプから所定距離離れて覆う反射鏡と、を備えた露光ユニットであって、前記反射鏡の前記露光ランプと反対側の面に放熱用フィンが設けられていることにより、上記目的を達成している。

【００２２】上記構成によれば、露光ランプの周囲を覆う反射鏡の露光ランプと反対側の面に放熱用フィンを設けているので、反射鏡の熱を放熱用フィンを介して効率的に放熱して、反射板の温度上昇を低く抑えることができ、露光ユニットの光源である露光ランプとそれを囲む反射鏡を効率よく冷却することができる。

【００２３】この場合、例えば、請求項２に記載するように、前記反射鏡は、前記放熱用フィンに空気を送風するファンが取り付けられていてもよい。

【００２４】上記構成によれば、反射板に設けた放熱用フィンに空気を送風するファンを取り付けているので、ファンから放熱用フィンに直接かつ効果的に送風して、放熱用フィン及び反射板を冷却することができ、冷却効率をより一層向上させることができる。

【００２５】また、例えば、請求項３に記載するように、前記冷却用フィンは、前記反射鏡の周囲を流れる空気の流れの方向に対して平行に配設されていてもよい。

【００２６】上記構成によれば、冷却用フィンを反射鏡の周囲を流れる空気の流れの方向に対して平行に配設しているので、放熱用フィンの配列面に沿って空気が流れるようにすることができ、冷却効率をより一層向上させることができる。

【００２７】請求項４記載の発明の定着ユニットは、ヒーターにより加熱され回転駆動される定着ローラと、前記定着ローラに圧接され前記定着ローラとともに回転する加圧ローラと、少なくとも前記定着ローラの前記加圧ローラと反対側を覆う定着カバーと、前記定着カバーの周囲に空気を送風するファンと、を備えた定着ユニットであって、少なくとも前記定着カバーの前記ファンからの空気の通過部分に放熱用フィンが設けられていること

により、上記目的を達成している。

【００２８】上記構成によれば、定着ローラと加圧ローラが圧接され、定着ローラが定着カバーにより覆われた定着ユニットの当該定着カバーのファンからの空気の通過部分に、放熱用フィンを設けているので、定着カバーの熱を放熱用フィンを流れるファンからの空気により放熱して、定着カバーの表面の温度を効率的に低下させることができ、周囲への熱影響を防止することができる。

【００２９】請求項５記載の発明の定着ユニットは、ヒーターにより加熱され回転駆動される定着ローラと、定着定着ローラに圧接され定着定着ローラとともに回転する加圧ローラと、少なくとも前記定着ローラの前記加圧ローラと反対側を覆う定着カバーと、前記定着カバーの周囲に空気を送風するファンと、を備えた定着ユニットであって、前記定着カバーの前記定着ローラ側の面に放熱用フィンが設けられ、前記ファンの送風方向が当該放熱用フィンに向けられていることにより、上記目的を達成している。

【００３０】上記構成によれば、定着ローラと加圧ローラが圧接され、定着ローラが定着カバーにより覆われた定着ユニットの当該定着カバーの定着ローラ側の面に、放熱用フィンを設けるとともに、ファンからこの放熱用フィンに送風するので、定着カバーを、断熱だけでなく、放熱用に利用して、定着ローラ側の面に設けた放熱用フィンにより、定着ローラからの余分な熱を吸熱・集熱し、放熱用フィンに集められた熱をファンからの空気で冷却することができ、定着カバーから外側に伝達される熱量を減少させることができる。

【００３１】この場合、例えば、請求項６に記載するように、前記定着カバーは、断熱性の良好な部材で形成され、前記放熱用フィンは、熱伝導率の良好な部材で形成されていてもよい。

【００３２】上記構成によれば、定着カバーを断熱性の良好な部材で形成し、放熱用フィンを熱伝導率の良好な部材で形成しているので、銅合金、アルミニウム合金等の熱伝導率の良好な放熱用フィンにより周囲の熱をより一層レスポンス良く吸熱あるいは集熱することができるとともに、耐熱性のプラスチック等の断熱性の定着カバーにより定着ローラからの熱が外側へ伝達されるのをより一層抑制することができる。

【００３３】

【発明の実施の形態】以下、本発明の好適な実施の形態を添付図面に基づいて詳細に説明する。なお、以下に述べる実施の形態は、本発明の好適な実施の形態であるから、技術的に好ましい種々の限定が付されているが、本発明の範囲は、以下の説明において特に本発明を限定する旨の記載がない限り、これらの態様に限られるものではない。

【００３４】図１は、本発明の露光ユニットの第１の実施の形態を示す図であり、本実施の形態は、請求項１及び請求項３に対応するものである。図１は、本発明の露光ユニットの第１の実施の形態を適用した露光ユニット１の側面断面図である。

【００３５】図１において、露光ユニット１は、光源としてのハロゲンランプ２と反射板３を備えており、露光ユニット１には、図示しないファンから図１の面に鉛直方向に空気が送風される。

【００３６】ハロゲンランプ２は、原稿読取幅に応じて、所定の長さを有しており、図示しない原稿に光を照射する。この原稿で反射された光は、第１ミラー４及びその他の光学系を介して光電変換素子（例えば、ＣＣＤ（Charge Coupled Device ）等）に導入されて、光電変換素子で画像データに変換される。

【００３７】反射板３は、ハロゲンランプ２と所定間隔離れて配設されており、ハロゲンランプ２側の面が約Ｕ字型に形成されて、鏡面に磨かれている。反射板３のハロゲンランプ２と反対側の外面には、反射板３の当該外面から外方に突出した放熱用フィン５が形成されており、放熱用フィン５は、反射板３の外面の全面に形成されている。各放熱用フィン５は、図１の面に鉛直な方向に長く形成されており、上記ファンからの送風方向に並行に配列されている。反射板３及び放熱用フィン５は、共に熱伝導率の良好な部材、例えば、アルミ合金により形成されている。

【００３８】次に、本実施の形態の動作を説明する。露光ユニット１は、動作時、ハロゲンランプ２が点灯されると、ハロゲンランプ２が発熱し、ハロゲンランプ２の発熱により反射板３が加熱される。ところが、反射板３には、放熱用フィン５が形成されており、反射板３及び放熱用フィン５には、図示しないファンから図１の紙面に鉛直な方向から空気が送風される。したがって、反射板３の熱は、放熱用フィン５に送風されるファンの空気により放熱用フィン５を介して効率的に放熱され、反射板３の温度上昇を抑制することができる。

【００３９】また、放熱用フィン５は、ファンからの空気の流れに平行に配列されて形成されているため、ファンからの空気が放熱用フィン５の間を放熱用フィン５に沿って流れ、放熱用フィン５からより一層効率的に放熱することができる。

【００４０】〈実験例〉上記実施の形態の露光ユニット１を使用して、放熱用フィンの形成されていない反射板のみの従来の露光ユニットとの冷却効果の比較実験を行った。

【００４１】実験は、本実施の形態の露光ユニット１の反射板３の内側及び従来の露光ユニットの反射板の内側にそれぞれ熱電対を張り付けて、温度上昇を飽和させないために、連続コピー動作を１００枚分行って、そのときの熱電対の検出した本実施の形態の露光ユニット１の反射板３及び従来の露光ユニットの反射板の温度比較を行った。なお、この場合、本実施の形態の露光ユニット

1の反射板3及び従来の露光ユニットの反射板は、共に、アルミにより形成されている。

【0042】実験結果は、フィンの付いていない従来の露光ユニットでは、反射板の上昇温度（室温からの増分）は、50℃と高く、アルミ製反射板は、表面酸化によって局部的に白濁したり、露光ユニットがスキャンするときにキシミ音がするなど、機械的精度にも、不具合が生じていた。

【0043】これに対して、本実施の形態の露光ユニット1にあっては、上昇温度は、35℃と低く、従来生じていたような反射板3の表面の酸化による局部的白濁やキシミ音等の不具合は、解消された。したがって、反射板3の表面に放熱用フィン5を形成することによって冷却効果が向上されていることが確認された。

【0044】図2は、本発明の露光ユニットの第2の実施の形態を示す図であり、本実施の形態は、請求項2及び請求項3に対応するものである。

【0045】なお、本実施の形態は、上記第1の実施の形態と同様の露光ユニットに適用したものであり、本実施の形態の説明においては、上記第1の実施の形態の露光ユニットと同様の構成部分には、同一の符号を付して、その詳細な説明を省略する。

【0046】図2において、露光ユニット10は、図示しないハロゲンランプ2、反射板3及びファン11を備えており、反射板3には、放熱用フィン5が形成されている。

【0047】ファン11は、反射板3の一方側側面（図2の左側側面）に取り付けられており、反射板3及びハロゲンランプ2に向かって空気を送風する。すなわち、ファン11は、フィン5の形成された反射板3に一体として取り付けられている。反射板3に形成されている放熱用フィン5は、ファン11からの空気の流れ方向に沿って平行に形成されており、ファン11から送風された空気がフィン5に沿って流れる。このファン11は、例えば、40mm×40mm、t＝10mm厚のものが使用されており、12［V］の直流電圧（DC）、80［mA］の電流で動作するものが利用されている。ファン11は、ハロゲンランプ2の点灯動作と同期して回転駆動される。

【0048】したがって、本実施の形態によれば、反射板3に放熱用フィン5を形成するとともに、ファン11を取り付けているので、ファン11からの空気によりハロゲンランプ及び反射板3を空冷するとともに、放熱用フィン5を介して反射板3の熱をより一層効率的に放熱させることができ、反射板3の温度上昇をより一層抑制することができる。特に、放熱用フィン5がファン11の送風方向に沿って配列されているため、ファン11からの空気が放熱用フィン5の間を放熱用フィン5に沿って流れ、反射板3の熱を放熱用フィン5からより一層効率的に放熱することができる。

【0049】〈実験例〉上記実施の形態の露光ユニット10を使用して、放熱用フィンの形成されていない反射板のみの従来の露光ユニットとの冷却効果の比較実験を行った。

【0050】実験は、本実施の形態の露光ユニット10の反射板3の内側及び従来の露光ユニットの反射板にそれぞれ熱電対を張り付けて、温度上昇を飽和させないために、連続コピー動作を100枚分行って、そのときの熱電対の検出した本実施の形態の露光ユニット1の反射板3及び従来の露光ユニットの反射板の温度比較を行った。なお、この場合、本実施の形態の露光ユニット10の反射板3及び従来の露光ユニットの反射板は、共に、アルミにより形成されている。

【0051】実験結果は、フィンの付いていない従来の露光ユニットでは、反射板の上昇温度（室温からの増分）は、上記実験例と同様に、50℃と高く、アルミ製反射板は、表面酸化によって局部的に白濁したり、露光ユニットがスキャンするときにキシミ音がするなど、機械的精度にも、不具合が生じていた。

【0052】これに対して、本実施の形態の露光ユニット10にあっては、上昇温度は、25℃と上記第1の実施の形態の露光ユニット1よりもさらに低く、従来生じていたような反射板3の表面の酸化による局部的白濁やキシミ音等の不具合は、解消されるとともに、ジッタ等の画像のブレが解消された。したがって、反射板3に放熱用フィン5を形成するとともに、ファン11から放熱用フィン5の形成された反射板3に送風することによって、冷却効果がより一層向上されていることが確認された。

【0053】なお、本実施の形態においては、ファン11を、図2の反射板3の左端側に取り付けているが、ファン11は、反射板3の右端側に取り付けてもよく、また、温度上昇の大きさに応じて、反射板3の左右それぞれにファン11を取り付けて、プッシュプルで使用するしてもよい。

【0054】また、上記第1及び第2の実施の形態においては、放熱用フィン5を反射板3の長手方向に平行に配列しているが、放熱用フィン5の配列方向は、反射板3の長手方向に配列するものに限るものではなく、外部ファンや反射板3に取り付けられたファン11から反射板3に送風される空気の流れの向きに合わせて、形成してもよい。例えば、外部ファンや反射板3に取り付けられたファン11からの空気流が、図3に示すように、反射板3の短手方向（図3の矢印で示す方向）に流れるときには、当該空気流の流れる反射板3の短手方向に放熱用フィン12を形成する。

【0055】なお、図3に示したように放熱用フィン12を形成して、外部ファンからのみの送風で露光ユニットの温度上昇の実験を、上記第1の実施の形態で説明した実験例と同様に行ったところ、反射板3の上昇温度

は、30℃に抑えられた。

【0056】図4は、本発明の定着ユニットの第3の実施の形態を示す図であり、本実施の形態は、請求項4に対応するものである。図4は、本発明の定着ユニットの第3の実施の形態を適用した定着ユニット20の側面断面図である。

【0057】図4において、定着ユニット20は、回転駆動される定着ローラ21と加圧ローラ22が圧接されており、定着ローラ21及び加圧ローラ22には、それぞれ定着ローラ21及び加圧ローラ22を加熱するヒーター23、24が内蔵されている。

【0058】加圧ローラ22の下方は、底板25により覆われており、定着ローラ21の上部には、内板26が配設されているとともに、内板26の上方及び定着ローラ21の左右両側を覆うように定着カバー27が配設されている。定着カバー27の左側外面には、複数の放熱用フィン28が形成されており、放熱用フィン28は、図4の紙面に対して鉛直方向に所定長さ、例えば、350mmにわたって長く延びる状態で形成されている。定着カバー27の放熱用フィン28の形成されている部分には、図示しない外部ファンから冷却空気が送風される。

【0059】定着ローラ21と加圧ローラ22の圧接部には、給紙ガイド29によりトナー画像の付着された記録紙が搬送され、ヒーター23、24により加熱される定着ローラ21と加圧ローラ22により記録紙上のトナー画像を記録紙に定着させて、排紙ガイド30上を図外の排紙トレイ上に排出する。

【0060】次に、本実施の形態の動作を説明する。定着ユニット20は、ヒーター23により定着ローラ21が加熱され、ヒーター24により加圧ローラ22が加熱された状態で、給紙ガイド29上をトナー画像の付着された記録紙が定着ローラ21と加圧ローラ22の圧接部に搬送されてくると、加熱された定着ローラ21と加圧ローラ22により記録紙上のトナーを記録紙に融着させて、定着の完了した記録紙を排紙ガイド30上を排出する。

【0061】このとき、ヒーター22により加熱される加圧ローラ24及びヒーター23により加熱される定着ローラ21から放熱される熱により定着ローラ21を覆う定着カバー27が加熱される。

【0062】ところが、定着カバー27には、その外部ファンからの冷却空気の送風される部分に、放熱用フィン28が形成されているため、放熱フィン28から定着カバー27の熱を効率的に放熱及び排熱することができ、定着カバー27が過熱されるのを防止することができる。すなわち、トナーを融着させるために必要な熱が機器の周囲のユニットに副作用を及ぼすので、必要以外の熱を、機内の空気の流れと放熱用フィン28を最適に組み合わせることによって、効率的な排熱を行うことができる。

【0063】〈実験例〉上記実施の形態の定着ユニット20を使用して、従来の放熱用フィンの形成されていない同様の構成の定着ユニットとの冷却効果の比較実験を行った。

【0064】実験は、本実施の形態の定着ユニット20の定着カバー27の上面及び従来の定着ユニットの定着カバーの上面に熱電対を張り付けて、定着動作を行わせたときの、温度上昇を比較測定した。

【0065】実験結果は、フィンの形成されていない従来の定着ユニットでは、外部ファンからの空気の流れが平面に形成された定着カバーの側面を流れる際に冷却する効果は少なく、そのため、定着カバーの温度は、105℃にも上昇していた。

【0066】これに対して、本実施の形態の定着ユニット20では、温度上昇は、85℃までであった。したがって、多数の放熱用フィン28の間を空気が流れるため、冷却効率が高いことが確認された。

【0067】図5は、本発明の定着ユニットの第4の実施の形態を示す図であり、本実施の形態は、請求項5及び請求項6に対応するものである。

【0068】なお、本実施の形態は、上記第3の実施の形態と同様の定着ユニットに適用したものであり、本実施の形態の説明においては、上記第3の実施の形態の定着ユニットと同様の構成部分には、同一の符号を付して、その詳細な説明を省略する。

【0069】図5において、定着ユニット40は、定着ローラ21、加圧ローラ22、ヒーター23、24、底板25、内板26及び定着カバー41等を備えており、定着カバー41は、その内側全面に多数の放熱用フィン42が形成されている。放熱フィン32は、定着カバー41内を空気が流れやすい方向に形成されている。

【0070】したがって、本実施の形態によれば、定着ユニット40の定着カバー41に形成された放熱用フィン42に定着ローラ21及び加圧ローラ22で発生された熱を吸熱及び蓄熱し、熱を吸熱及び蓄熱した放熱用フィン42の間を冷却空気が流れることにより、効率よく排熱を行うことができる。

【0071】〈実験例〉上記実施の形態の定着ユニット40を使用して、従来の放熱用フィンの形成されていない同様の構成の定着ユニットとの冷却効果の比較実験を行った。

【0072】実験は、本実施の形態の定着ユニット40の定着カバー41の上方へ10mmの空間を隔てた位置及び従来の定着ユニットの定着カバーの上方へ10mmの空間を隔てた位置に熱電対を配置して、定着動作を行わせたときの、温度上昇を比較測定した。

【0073】実験結果は、フィンの形成されていない従来の定着ユニットでは、定着カバーの上方10mmの位置の温度は、75℃であったが、これに対して、本実施

の形態の定着ユニット４０では、温度上昇は、５５℃と従来の定着ユニットよりも２０℃も低かった。したがって、本実験により、多数の放熱用フィン４２により熱を吸熱及び蓄熱して、この放熱用フィン４２の間を流れる冷却空気により排熱され、冷却効率が高いことが確認された。

【００７４】なお、上記第４の実施の形態においては、定着カバー４１を、耐熱性プラスチックであるＰＴＦＥ（ポリテトラフルエチレン）を用いた断熱材料により形成し、放熱用フィン４２を、熱伝導率の高い銅合金あるいはＡｌ－Ｍｇ合金により形成してもよい。

【００７５】このようにすると、断熱材料により形成した定着カバー４１により定着ローラ２１及び加圧ローラ２２から発生される熱を定着ユニット４０の適用される機器内に放熱されるのを抑制することができるとともに、定着ローラ２１及び加圧ローラ２２から発生された熱を熱伝導率の高いＡｌ－Ｍｇ合金等で形成された放熱用フィン４２で効率よく吸熱及び蓄熱し、放熱用フィン４２に吸熱及び蓄熱した熱を放熱用フィン４２を通過する冷却空気により、効率的に排熱することができる。

【００７６】〈実験例〉上記第４の実施の形態と同様の構成の定着ユニット４０において、定着カバー４１と放熱用フィン４２を熱伝導の良好なアルミ合金で構成した場合と、定着カバー４１を断熱材料のＰＴＦＥで形成し、放熱用フィン４２を高熱伝導率材料のＡｌ－Ｍｇ合金で形成した場合とで、定着カバー４１の上方１０ｍｍの位置に熱電対を設置して比較実験した。

【００７７】実験結果は、定着カバー４１と放熱用フィン４２をともにアルミ合金で構成した場合には、７５℃であったが、定着カバー４１をＰＴＦＥで、放熱用フィン４２をアルミ合金で構成した場合には、４５℃であった。

【００７８】したがって、定着カバー４１と放熱用フィン４２の材料を断熱材と高熱伝導率材料に設定することにより、周囲温度が、大幅に低下し、信頼性の確保が十分確保されることが実証された。

【００７９】以上、本発明者によってなされた発明を好適な実施の形態に基づき具体的に説明したが、本発明は上記のものに限定されるものではなく、その要旨を逸脱しない範囲で種々変更可能であることはいうまでもない。

【００８０】

【発明の効果】請求項１記載の発明の露光ユニットによれば、露光ランプの周囲を覆う反射鏡の露光ランプと反対側の面に放熱用フィンを設けているので、反射鏡の熱を放熱用フィンを介して効率的に放熱して、反射板の温度上昇を低く抑えることができ、露光ユニットの光源である露光ランプとそれを囲む反射鏡を効率よく冷却することができる。

【００８１】請求項２記載の発明の露光ユニットによれば、反射板に設けた放熱用フィンに空気を送風するファンを取り付けているので、ファンから放熱用フィンに直接かつ効果的に送風して、放熱用フィン及び反射板を冷却することができ、冷却効率をより一層向上させることができる。

【００８２】請求項３記載の発明の露光ユニットによれば、冷却用フィンを反射鏡の周囲を流れる空気の流れの方向に対して平行に配設しているので、放熱用フィンの配列面に沿って空気が流れるようにすることができ、冷却効率をより一層向上させることができる。

【００８３】請求項４記載の発明の定着ユニットによれば、定着ローラと加圧ローラが圧接され、定着ローラが定着カバーにより覆われた定着ユニットの当該定着カバーのファンからの空気の通過部分に、放熱用フィンを設けているので、定着カバーの熱を放熱用フィンを流れるファンからの空気により放熱して、定着カバーの表面の温度を効率的に低下させることができ、周囲への熱影響を防止することができる。

【００８４】請求項５記載の発明の定着ユニットによれば、定着ローラと加圧ローラが圧接され、定着ローラが定着カバーにより覆われた定着ユニットの当該定着カバーの定着ローラ側の面に、放熱用フィンを設けるとともに、ファンからこの放熱用フィンに送風するので、定着カバーを、断熱だけでなく、放熱用に利用して、定着ローラ側の面に設けた放熱用フィンにより、定着ローラからの余分な熱を吸熱・集熱し、放熱用フィンに集められた熱をファンからの空気で冷却することができ、定着カバーから外側に伝達される熱量を減少させることができる。

【００８５】請求項６記載の発明の定着ユニットによれば、定着カバーを断熱性の良好な部材で形成し、放熱用フィンを熱伝導率の良好な部材で形成しているので、銅合金、アルミニウム合金等の熱伝導率の良好な放熱用フィンにより周囲の熱をより一層レスポンス良く吸熱あるいは集熱することができるとともに、耐熱性のプラスチック等の断熱性の定着カバーにより定着ローラからの熱が外側へ伝達されるのをより一層抑制することができる。

【図面の簡単な説明】

【図１】本発明の露光ユニットの第１の実施の形態を適用した露光ユニットの側面断面図。

【図２】本発明の露光ユニットの第２の実施の形態を適用した露光ユニットの斜視図。

【図３】放熱用フィンの形成方向を異ならせた例を示す反射板の斜視図。

【図４】本発明の定着ユニットの第３の実施の形態を適用した定着ユニットの側面断面図。

【図５】本発明の定着ユニットの第４の実施の形態を適用した定着ユニットの側面断面図。

【符号の説明】

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1　露光ユニット
2　ハロゲンランプ
3　反射板
4　第1ミラー
5、12　放熱用フィン
10　露光ユニット
11　ファン
20　定着ユニット
21　定着ローラ
22　加圧ローラ

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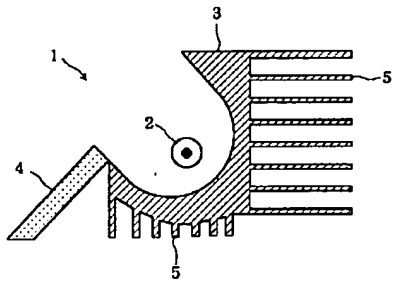
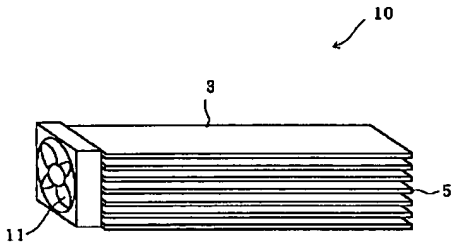
23、24　ヒーター
25　底板
26　内板
27　定着カバー
28　放熱用フィン
29　給紙ガイド
30　排紙ガイド
40　定着ユニット
41　定着カバー
42　放熱用フィン

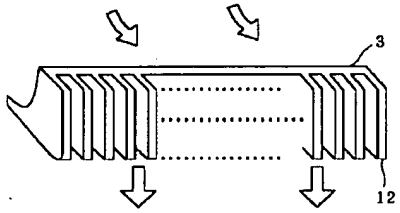
【図1】



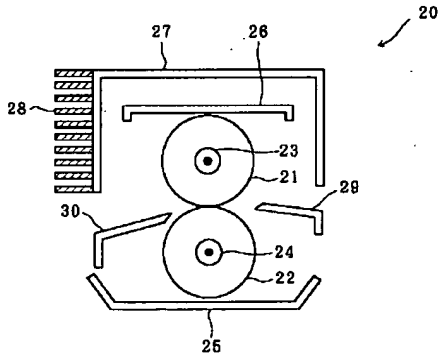
【図2】



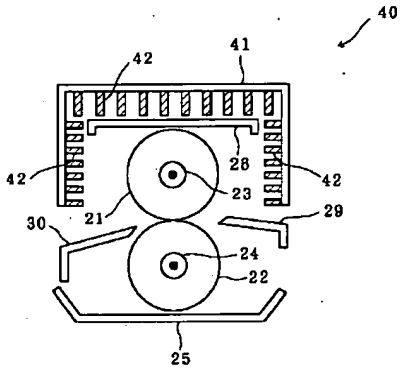
【図3】



【図4】



【図5】



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DERWENT-ACC-NO: **1998-471425**

DERWENT-WEEK: 199841

TITLE: Exposure system with cooling function for laser printer, copier, **scanner** - includes radiating fins arranged on rear surface of **reflective plate** for dissipation of heat produced on **reflective plate** by heat emission of halogen lamp

PATENT-ASSIGNEE: RICOH KK[RICO]

PRIORITY-DATA: 1997JP-0014456 (January 10, 1997)

PATENT-FAMILY:

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JP 10197969 A	July 31, 1998	N/A	008	G03B 027/52

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 10197969A	N/A	1997JP-0014456	January 10, 1997

INT-CL (IPC): F25D001/00, G03B027/52 , G03G015/04 , G03G015/20

ABSTRACTED-PUB-NO: JP 10197969A

BASIC-ABSTRACT:

The system (1) has a halogen lamp (2). A reflective plate (3) is arranged around the lamp at a predetermined distance.

Several fins (5) are provided on the rear surface of the reflective plate for

dissipation of heat produced by the heat emission of the halogen lamp. A fan is provided to blast forced air on the fins and the reflective plate for effective dissipation of heat.

ADVANTAGE - Radiates heat produced on reflective plate efficiently and effectively, thereby prevents temperature rise of exposure system. Improves cooling efficiency.

CHOSEN-DRAWING: Dwg.1/5

TITLE-TERMS: EXPOSE SYSTEM COOLING FUNCTION LASER PRINT COPY SCAN RADIATE FIN
ARRANGE REAR SURFACE REFLECT PLATE DISSIPATE HEAT PRODUCE REFLECT
PLATE HEAT EMIT HALOGEN LAMP

DERWENT-CLASS: P82 P84 Q75 S06 T04 W02

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